

JOURNAL  
OF THE  
**American Veterinary Medical  
Association**

FORMERLY  
**AMERICAN VETERINARY REVIEW**  
(Original Official Organ U. S. Vet. Med. Ass'n)  
EDITED AND PUBLISHED FOR  
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by W. H. Dalrymple, Baton Rouge, La.

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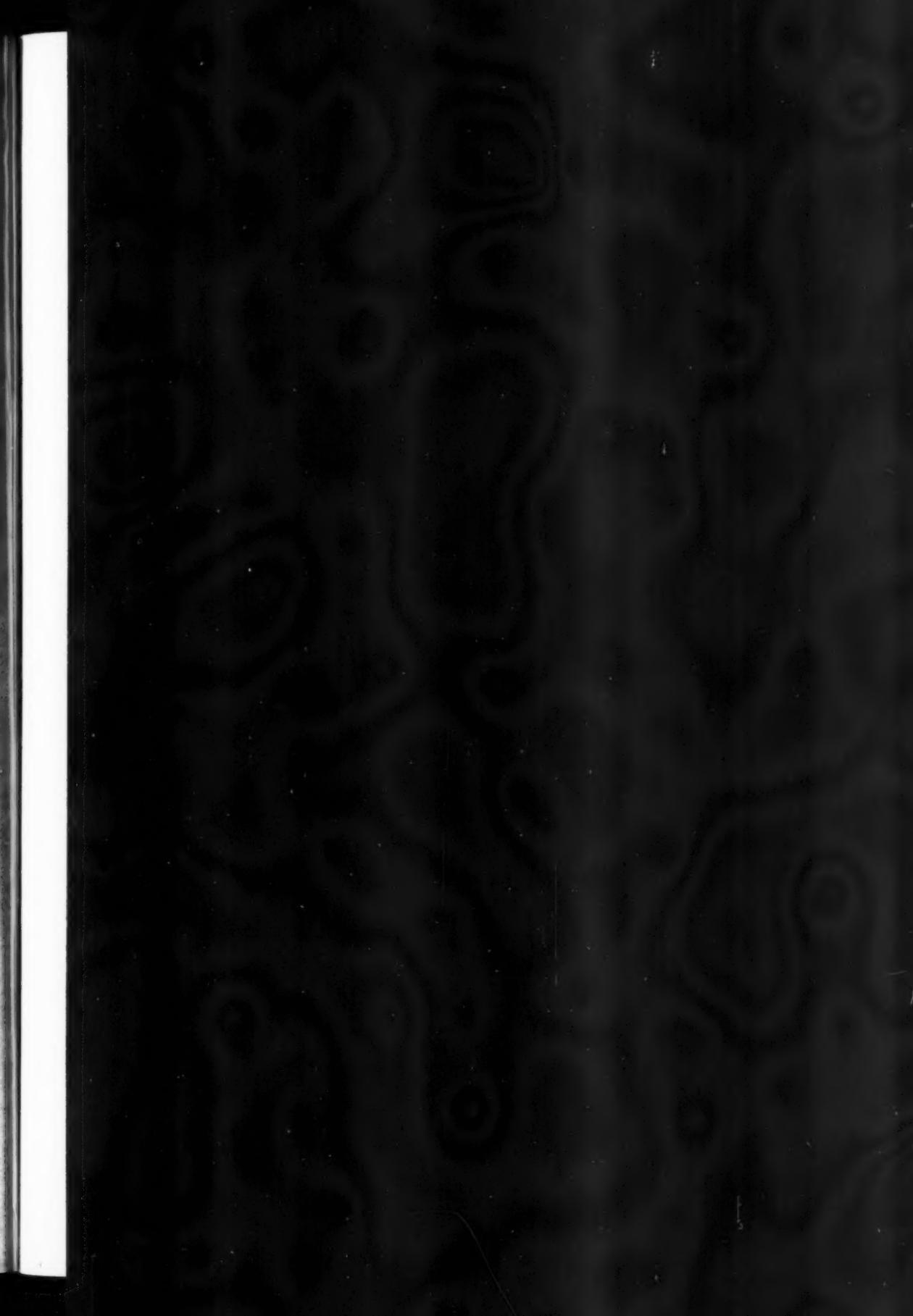
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**W. H. DALRYMPLE, Editor.**

**BATON ROUGE, LA.**

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OCTOBER, 1918

No. 1.

*Editor's Note:* Owing to the Journal equipment having to be moved from Ithaca, N. Y., to Baton Rouge, La., between the September and October issues, it is possible the latter may be a little delayed in delivery, and the number itself not quite up to the usual size and standard. However, we have tried to do the best possible under the rather trying circumstances, and we crave the indulgence of our readers for this time.                            W. H. D.

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**A WORD FROM THE NEW EDITOR.**

In assuming the responsibility of the editorship and business management of The Journal, the writer does so with considerable trepidation. In taking up the cudgels just recently laid down by such a finished journalist as Dr. Fish, who has resigned to take a more active part in the service of his country, the writer has undertaken a responsibility that has given him very grave concern.

However, he has done so as a matter of duty at this trying time, and he very highly appreciates the compliment and honor, and the confidence reposed in him by the Association. He will

do his utmost to continue to merit that confidence—no man can do more.

The success of The Journal does not, however, depend upon the effort of one individual. The publication belongs to each member of the Association, and each has his individual responsibility in making it fully representative of our great veterinary organization.

We plead, therefore, for the heartiest co-operation of the entire membership, and the profession as a whole, in aiding us maintain the high standard our official organ has hitherto held under former able editors. The motto *Vis unita fortior* is extremely applicable in our case, and is as essential to the success of our publication as to that of any other line of endeavor; and if each one of us will adopt this motto and live up to it, our success will be assured. In fine, our Journal will be just what each member desires to make it. The new editor (one man) intends to do his best, which can not be a great deal, however, unless he receives the united support of the membership as a whole. Therefore, a generous response is asked for, and it is believed it will be forthcoming.

W. H. DALRYMPLE.

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#### OUR LADIES' AUXILIARY RELIEF FUND COMMITTEE.

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In a recent number of the Veterinary Journal (London) a very complimentary reference was made to our Ladies' Auxiliary Relief Fund Committee, but the editor expressed himself as not quite clear as to its function compared to some of the aids the ladies were rendering our British confreres over there.

As a matter of information to readers of the British journal, it may be stated that after the United States entered the world's war, the American Veterinary Medical Association, at its 54th annual meeting in Kansas City last year, took up a subscription on the spot, which reached a considerable sum, and appointed a Relief Committee to carry on this work. At the same time the ladies became interested, and in order to do what they could to assist, a Ladies' Auxiliary Committee was appointed to solicit subscriptions from the wives, daughters and sisters of not only the male members of the Association, but of those of the profession generally throughout the country. So that the Ladies'

Committee is, as the name implies, an aid, and a very important one, to the main Committee in raising funds for the purpose for which it was organized.

It may also be of interest to state that at the recent annual meeting of the A. V. M. A. at Philadelphia, the treasurer of the Relief Fund reported a total in hand of over \$5,000, the Fund now to be known as the Liautard Relief Fund, as a tribute to the memory of the late Dr. A. Liautard, who, we understand, originated the fund on the Continent; and also that the sum of \$2,500 was voted by the Association to be sent at once to the President, in France, of the Anglo-Franco-Belge Veterinary Relief Fund to help our suffering confreres in Europe, the amount to be presented by the ranking officer of the United States Army Veterinary Service in France at the time. We feel sure that the ladies of our Auxiliary will sincerely appreciate the fact that the Veterinary Journal has been pleased to compliment them on their beneficent work.

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## WHAT DO WE KNOW ABOUT VITAMINES?

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In answer to our own question, we believe we may say that, as yet, not a great deal is known concerning these dietary essentials, collectively spoken of as vitamines. However, since 1912, when attention was first directed to them by Casimir Funk, nutrition experts have felt that they had something tangible to investigate, and that the investigation would probably result in the discovery of the cause, or causes, of what are classed in human medicine as "deficiency diseases," such, for example, as scurvy, rickets, beri-beri, and probably pellagra.

Vitamines seem to be supplied the body through the food intake, and some foods are much richer than others in these essentials. It would seem, also, that the preparation which certain human foods undergo destroys their vitamine value, which would account, in some measure, for nutrition-deficiency being more observed in the human being than in the lower creatures with which the veterinarian has to deal, although the subject is one which, doubtless, will have to be taken up by the animal dietician. Investigators seem to have discovered the presence of these vitamines in the form of a crystalline substance in all natural foods, and claim that they appear to be essential to the economy in stimulating the internal secretions which are physiologically nec-

essary to perfect assimilation and normal metabolism; also, that they can be divided into at least two types, both being soluble in water, but only one in fats, this difference in properties having led to their characterization, respectively, as fat-soluble and water-soluble vitamines. Without either kind in the diet, however, it is claimed that animal life, or, at least, that high in the genetic scale, is impossible.

The subject is a very interesting and important one, and a great deal of information concerning it may be obtained by a careful perusal of the excellent paper on Vitamines and Nutrition by our former editor, Dr. Fish, which appears in this number of the Journal.

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### "MISERY LOVES COMPANY."

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Veterinary sanitarians are frequently heard to deplore the amount of negligence and indifference manifested by farmers and stockowners with reference to the proper disposal of their diseased carcasses, notwithstanding regulations governing such matters. This is perhaps more observable in sections of the country where anthrax infection is more or less prevalent. This state of affairs is not, however, confined to our own borders, but is found in other parts of the world.

In the latest annual report of the Veterinary Division of the Department of Agriculture, Union of South Africa, by the Acting Principal Veterinary Officer, we find, under the section on Anthrax, that that disease is responsible for more losses amongst stock than the rest of the contagious diseases combined, with the exception of East Coast Fever; and, judging from the number of outbreaks that have occurred within the Union, the disease is spreading rapidly and becoming a serious menace both to human and animal life. Loth as this officer is to say so, he is of the opinion that the spread of the infection is chiefly due to negligence on the part of the farmers and natives—more especially the latter, who will not bury a carcass intact if it can possibly be avoided; and this notwithstanding the wide dissemination of warnings and pamphlets on the disease among the farmers and natives, in the English, Dutch and native languages, but apparently with disappointing results, as the report states.

To sanitarians in some parts of our own Union, the above statements make rather familiar reading; and, while such condi-

tions in any part of the world are to be deplored in the universal fight against bacterial infections of a dangerous nature, we extend our sympathy to our friends down in South Africa, as some of us have passed and are passing through many similar experiences. In this connection, therefore, we may be pardoned for making use of the old adage, that "misery loves company."

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## THE INCREASED VALUE OF LIVE STOCK AND ITS INFLUENCE ON VETERINARY PRACTICE.

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The following editorial from the current number of *Veterinary News* (London) contains so much of what we think is both timely and of general application, that we take the liberty of reproducing it as an editorial in this number of the Journal:

It will be generally admitted that the value of live stock of all kinds has increased enormously of late years. Increased value has the effect of greater attention being devoted to the prevention and treatment of diseases. Animals are now treated in a skilled manner, which in pre-war days would either be handed over to the tender mercies of the empiric or amateur, or left to perish as not being worth the expense of veterinary attendance. Anyone who has devoted attention to the subject will recognize the fact that the losses incidental to irrational and ignorant treatment were enormous. Although there is still much room for reformation, we must admit that the value of veterinary science is gradually being recognized by farmers and stockowners, with the result that the sphere of the veterinary surgeon's work has become greatly extended. In spite of patent medicines, empirics, popular veterinary literature, and popular veterinary lecturers, the qualified man is able to penetrate into hitherto unexplored districts and to earn a living. The stockowner, be he large or small, has learned the necessity for saving the lives of his animals. No doubt he regards the matter from a commercial aspect, and commences to see the folly of empiricism and the inimical effects of amateur treatment. He is utilizing the opportunities which are presented to him, and is aware of the losses incidental to calling in professional aid when an animal is almost moribund. The loss of even a calf, a lamb, or a pig is now regarded as a serious matter, while in former times it was taken for granted that a varying number of young animals should succumb yearly. The

result was that if anyone took the trouble to ascertain the sum total of the losses in any district, it would amount to a very large figure; but the matter was not deemed worthy of public attention. It required an outbreak of an epizootic disease to demonstrate the importance of veterinary science and preventive medicine. In the present instance the war has been the leading factor in bringing about the greatly increased value of live stock and the necessity for attention to veterinary science.

It is well to consider whether we as a profession have taken advantage of the opportunities presented to us for advancement, progress, and research. Are we educating our students with a view to render them, when qualified, of the greatest use and assistance possible to farmers and stockowners? It does not require a philosophical mind to discover the fact that the student who thinks he will gain all the information necessary for country practice from any veterinary college will be grievously disappointed. Yet we cannot ignore the necessity and importance of ensuring that young graduates should at least possess more knowledge than farm stewards as regards the care and management of young stock when suffering from common maladies.

The truth is that the necessity for teaching clinically in connection with the diseases of farm animals has not yet been fully recognized. It is assumed that the student will pick up such information as he goes along, and the fact that he will be brought into contact with experienced farm stewards when he is qualified is ignored.

The duty of the profession is clear as regards this matter. The requirements of the stockowner must be catered for, and more attention must be devoted to the diseases of young stock and their prevention. From the professional point of view, it is our duty to adopt every means to increase knowledge, to prevent disease, and to encourage research. We must show stockowners that we are specially interested in the prevention and treatment of disease, and will devote all our energies to overcome the many difficulties and to solve the numerous problems associated with the maladies of the animals of the farm.

Without doubt, if we devote attention to the subject, and overcome the apathy which formerly was so common in connection with what were regarded as animals of little value, we shall find a large increase in the opportunities for professional work. Further, we shall be enabled to curtail the large profits of the

patent medicine vendors, and to give quacks and empirics the *coup de grâce*. One reason why these succeeded in flourishing was that in the "good old days" the veterinary profession devoted chief attention to valuable equine patients and did not trouble about the animals of the farm. The patent medicine vendor and the empiric seized the opportunity, and made it pay. It is now time that the reaction occurred, and we should adopt measures to clear our domain from the poachers and vermin which have so long gained a firm footing therein.

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### CHANGE OF DISTRICTS.

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On account of the large number of members in District No. 2, the Executive Board has divided this district as follows: District No. 2 now includes the New England States, New York, Pennsylvania, New Jersey and Delaware, and District No. 3 now includes Ohio, Indiana, Michigan, Illinois and Wisconsin. Notices for nominations for candidates for members of the Executive Board will be sent out during September and a postal card vote for the election of members of the Board from these districts will follow as soon as possible.

The districts as now constituted are as follows:

District No. 1—Canada.

District No. 2—New England States, New York, Pennsylvania, New Jersey and Delaware.

District No. 3—Ohio, Indiana, Michigan, Illinois and Wisconsin.

District No. 4—Kentucky, West Virginia, Virginia, Maryland, District of Columbia, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida, Cuba and South America.

District No. 5—Alaska, Washington, Montana, North Dakota, South Dakota, Minnesota, Iowa, Nebraska, Wyoming, Idaho, Oregon, Philippines and Hawaii.

District No. 6—California, Nevada, Utah, Colorado, Kansas, Missouri, Arkansas, Oklahoma, Louisiana, Texas, New Mexico, Arizona, Mexico and Central America.

N. S. M.

## THE LIVE STOCK INDUSTRY, PRESENT AND PROSPECTIVE.\*

JOHN J. FERGUSON, of Swift & Co., Chicago.

These notes are offered with a full sense of appreciation of the great service rendered by members of the veterinary profession to the industry at the various stages of production, transportation, manufacturing and distribution.

In the present status of our food supply situation, domestic and foreign, every discussion of live stock matters must be a Help-Win-the-War argument.

We must win the war—we will win the war—but to win it the American Army and Navy, and the fighting forces of our Allies and their civilian population, must have abundant supplies of nourishing food, of which meat must be the principal factor.

The basic appeal of our national Food Administration is More Meat and More Wheat. Given these two primary foods in ample supply of exportable quality, our fighting men can and will fight to sure and certain victory. The duty and burden of supplying the bulk of this necessary meat rests directly upon farmers and stockmen of America.

### THE PRESENT LIVE STOCK SITUATION.

Since September 1, 1914, all old basic standards, prices and values have been swept away. Since then, the inexorable law of world-wide supply and demand has established an entirely new order of things in the production, marketing and distribution of live stock and their products.

The year 1917 saw the climax of these changed conditions. From our business operations we have compiled for your interest the following review of live stock production and prices for that year.

1917 was a year of abnormally high prices in general for all commodities and, although the prices of live stock and meats have not risen as much as those of other commodities, record prices have been the rule in the live stock market.

\* Presented at the 55th annual meeting of the American Veterinary Medical Association, Philadelphia, August 19-22, 1918.

### COMPARATIVE ADVANCES.

Dr. Charles R. Van Hise, President of the University of Wisconsin, an authoritative economist, had the following on January 11, 1918, in Vol. XLVII of Science, pages 1-10. A brief excerpt is as follows:

"Prices at about the middle of 1917, as compared with those three years earlier just before the outbreak of the war, for a number of the most important commodities, were roughly as follows:

- Meat animals and meats, 25 to 75 per cent higher.
- Wheat and flour, two and one-fourth times as much.
- Corn and cornmeal, an increase of 80 per cent.
- Potatoes, an increase of about 60 per cent.
- Sugar, an increase of 75 per cent.
- Cotton and cotton yarns, an increase of 75 per cent.
- Wool and worsted, two and one-third fold.
- Bituminous coal, from two to three fold.
- Copper, about two and one-half fold.
- Pig lead, about three fold.
- Pig iron, about three and two-thirds times as much.
- Steel billets, more than five fold.
- Spelter, nearly double.
- Petroleum, an increase of about 75 per cent."

This exhibit interests all of us as consumers as evidence that war advances in prices of live stock and other products have not been unduly great proportionate to other staples.

### LIVE STOCK PRICES 1917.

The highest prices paid for live stock in Chicago, 1917, together with dates, were as follows:

	Date 1917	Price per ewt.
Cattle.....	September 19.....	\$17.90
Hogs.....	August 21.....	20.00
Sheep.....	May 12.....	16.00
Lambs.....	May 17.....	20.60

These prices, however, were for choice lots that topped the market on the respective dates. The actual payments per hundred weight which we made at all plants for live stock for the fiscal years 1915, 1916 and 1917 were as follows:

	1915	1916	1917
Cattle.....	\$7.10	\$7.21	\$8.66
Hogs.....	7.09	8.49	12.89
Sheep and lambs.....	7.85	9.16	12.79

The rapid increase in prices is further brought out by the following statement, which shows our average prices paid in December, 1916, and December, 1917, and the percentage of increase:

	December 1916	December 1917	Per Cent Increase
Cattle.....	\$7.10	\$8.81	24.1
Hogs.....	9.78	16.67	70.3
Sheep.....	11.58	15.06	30.1
Average.....	8.69	11.70	34.8

1917 figures, issued by leading market papers, show that during the past ten years the price of native beef cattle has doubled; the price of hogs has increased two and one-half times, as shown from the following statement:

	Native Beef			
	Cattle	Sheep	Lambs	Hogs
1917.....	\$11.60	\$11.00	\$15.60	\$15.10
1907.....	5.80	5.25	7.05	6.10

The year was also marked by record receipts of cattle, which were the largest in the history of the country. When the 1916 marketings of cattle showed such an increase over previous years it was commonly believed that this was had at expense of stock and breeding cattle, but official figures indicate that the number of live cattle on farms in January, 1917, had increased in spite of the greater slaughterings of previous years.

#### BREEDING STOCK NOT SACRIFICED.

Official figures suggest the record-breaking marketings of 1917 were not made at the expense of breeding stock, but that in spite of popular opinion to the contrary there was an actual increase in the number of cattle on the farms. January, 1918, found more cattle on ranches, farms, and in feed lots than there were a year ago.

Receipts of hogs at central markets show a slight decrease compared with 1916. The need for hog products on the part of the Allies is urgent and should have primary attention. This necessity has already operated as a stimulant to increased production.

Receipts of cattle and hogs have continued to increase during the first six months of 1918.

	Receipts of Hogs at 10 Markets
1st 6 months 1918.....	14,468,443
1st 6 months 1917.....	13,543,926
Increase.....	6.8%

Receipts of Cattle at 10 Markets	
1st 6 months 1918.....	6,124,059
1st 6 months 1917.....	5,449,186
Increase.....	12.3%
Receipts of Sheep at 10 Markets	
1st 6 months 1918.....	4,662,660
1st 6 months 1917.....	4,928,007
Decrease.....	5.4%

It should also be noted that the average weight of hogs has been much greater during 1918 than during 1917. For example, average weight of hogs killed by Swift & Company at Chicago October 1, 1917, to June 1, 1918, was 15% greater than during the corresponding period of the previous year. Taking into account numbers of hogs received and average weight there has been an increase of nearly 25% in the total quantity of pork products available for consumption in 1918 as compared with 1917, which is a splendid answer from the country to the call of the United States Food Administration for more exportable meats.

While wholesale prices for meats have necessarily gone up with live stock prices, the increase has not been relatively as great. This saving to the consumer has been made possible through higher values and better utilization of by-products which result in better prices for live stock.

From 1915 to 1917 the wholesale price of meat has increased only 20.7%, whereas the price of live stock increased 39%.

#### LIVE STOCK RECEIPTS AND SUPPLY.

Receipts of cattle, hogs and sheep at nine principal markets for seven years—1911 to 1917, inclusive (years ending September 30)—were as follows:

Receipts of Cattle at Nine Principal Markets Years Ending Sep-tember 30, 1911-1917
--

Year	Number of Head
1911.....	9,416,374
1912.....	8,861,404
1913.....	9,108,500
1914.....	8,193,856
1915.....	8,464,185
1916.....	9,650,000
1917.....	12,278,000

Receipts of Hogs at Nine Principal  
Markets Years Ending Sep-  
tember 30, 1911-1917

Year	Number of Head
1911.....	19,217,508
1912.....	21,035,000
1913.....	19,997,000
1914.....	19,176,000
1915.....	21,366,000
1916.....	25,258,000
1917.....	25,049,000

Receipts of Sheep at Nine Principal  
Markets Years Ending Sep-  
tember 30, 1911-1917

Year	Number of Head
1911.....	13,530,000
1912.....	14,148,000
1913.....	14,148,000
1914.....	14,702,000
1915.....	11,994,000
1916.....	11,741,000
1917.....	11,415,000

The most important fact in these figures is a pronounced increase in receipts of cattle in 1917. Hogs show a slight decrease as compared with 1916—otherwise receipts of hogs were greater than for any previous year, and receipts of sheep show a continuous decline.

While it is true that live stock production has not increased in proportion to the increase of human population in this country, figures indicate that the live stock situation is not quite so serious as the public generally suppose.

We have good authority for believing that the number of cattle on farms in this country is greater today than ever before, in spite of the fact that the number sent to market for slaughter in 1917 was the greatest in our history.

The number of hogs has shown a slight decrease in 1917—both in the number on farms and the number sent to market. The short pig crop in 1917 is undoubtedly due to the high price of corn, which discouraged breeding, and the high price of hogs, which encouraged sale of breeding stock. Also, the unfavorable Spring of 1917 caused very heavy mortality among little pigs. In spite of the increase in 1917 being relatively less as compared with 1916, it should be remembered that production was greater than for any other previous year and that a new maximum will

undoubtedly be established in 1918. Hog production, although it has not quite kept pace with population, has shown a continuous actual increase. Sheep are the only important kind of live stock which have shown an actual, continuous production decrease.

#### PROSPECTS FOR LIVE STOCK INDUSTRY.

Every man in the live stock business would like a reliable prediction on future production and prices. Will supply and demand continue to operate in such a way that reasonable profits will be assured to the producer? On this matter, no one has any definite knowledge, but perhaps a survey of the situation may be of interest. For the duration of the war a wide and active market will probably obtain.

It is apparent that when the war ends, Europe will need quantities of American meats to feed her people. She will also require breeding stock to replenish her depleted flocks and herds. The demand from Europe for live stock products should continue good at fair prices.

Of the producing countries, Mexico has been rapidly exhausting her supply of meat-producing animals, pending the restoration of stable government. It will probably be long before Mexico becomes a considerable factor in the exportation of live stock.

Canada, suffering from an acute shortage of labor, has been reducing the number of cattle, sheep and hogs on her farms. Canada will not have much live stock, other than hogs, for export in the near future.

Australia and New Zealand are recovering from the effects of several seasons of scarcity of rainfall, which greatly depleted flocks and herds. Their production of sheep and mutton, which formed the basis of the world's supply, has been greatly reduced.

Live stock conditions are far from normal in South American producing countries. Money has been scarce in Brazil and Argentine, which, coupled with high prices for live stock, has checked increased production.

This survey indicates that producers need not fear over-production of live stock in this country within several years.

It is reasonable to expect, when this war is over, there will be a world market at fair prices for whatever live stock they produce.

## NEW CONDITIONS OFFER GREATER OPPORTUNITIES FOR CONSTRUCTIVE SERVICE IN THE VETERINARY PROFESSION.

It has long seemed to the writer as a business man that this Association, State and Local Veterinary Associations, and Veterinarians as individuals, may properly and productively undertake public service with a wider field and vision.

The American Veterinary Medical Association might well enlarge the scope of its activities along lines so successfully pursued by the United States Live Stock Sanitary Association by inviting the co-operation of national and state live stock organizations such as:

1. The American National Live Stock Association;
2. The National Wool Growers' Association;
3. National Pure-Bred Live Stock Record Associations;
4. State Live Stock Breeders' Associations;
5. Live Stock Traffic Departments of Trunk Line Railways;
6. American Meat Packers' Association, and other major organizations directly concerned in the live stock industry.

Better mutual understanding and co-operation could be established by inviting representatives of these organizations from time to time appear on the program of this Association so that if they had any grievance against the veterinary profession it might be ventilated freely. Suggestions for betterment of conditions affecting the industry might be exchanged.

This Association with its splendid resources might undertake a national campaign of education through live stock and farm papers dealing with control and eradication of—

Bovine Tuberculosis  
Contagious Abortion  
Tick Eradication (in state affected)  
Control of Hog Cholera  
Disposition of Diseased Carcasses on the Farm  
Pollution of Wells, Ponds, and Streams  
Construction of Sanitary Buildings, Yards, and Feed Lots  
Sanitary Water Supply, and an infinite variety of subjects of varying importance. Information on these matters could be disseminated in the form of concise popular bulletins.

In addition, this Association might properly secure a place on the program at major live stock conventions for veterinarians with a record of accomplishment along specific lines. We know

such men would be welcome at live stock gatherings and their message widely spread through bulletins and reports published by such Associations.

State and district veterinary associations could bring their members into more friendly and profitable relation with breeders, feeders, and farmers in their respective states by devoting a period at their annual meeting to papers and addresses from successful stockmen and farmers within the state whose work in breeding, feeding and maintenance of healthy herds would be an incentive to others along similar lines. State associations could accomplish results by interesting themselves more directly in the work of the Veterinary Department of their State Agricultural College and Experiment Station, which we have found in many cases sadly in need of such support. Where such co-operation is welcome a committee of the state association could do productive work in supporting the State Veterinarian or State Live Stock Sanitary Board in working for sanitary conditions in live stock departments of state, district and county fairs. Civic service freely rendered is now the motto of all good citizens.

State associations would render valuable public service in securing state and municipal legislation providing for official supervision of abattoirs operating without U. S. government inspection. It is widely recognized that such places are clearing-houses for numbers of meat animals which probably could never escape condemnation at the hands of B. A. I. inspectors. Public health and welfare demand this matter shall receive constructive consideration.

#### THE VETERINARIAN IN CIVIC WELFARE.

The modern progressive veterinarian must be much more than a horse and cow doctor. In his intimate association with stockmen and farmers he can be a man of influence and example in his community. His service should not be confined to paid service. In most cases, the veterinarian as an intelligent reader of live stock and farm journals and a student of the science and practice of animal breeding, knows the advantages of using pure-bred sires with quality developed along specialized lines. The use of such sires means larger returns in a shorter time for feed and labor, better quality, higher prices and more profit for the finished product. The veterinarian should persistently talk live stock improvement through the use of specialized lines of breeding for specific lines of production.

He should drop a word in season regarding the desirability and reliability of the tuberculin test and the necessity for careful handling of all reacting animals. Under average conditions the veterinarian sees little and hears less of tubercular animals on the farm. He could do much by suggestion to encourage cleaning up the herd and premises and so reduce preventable losses from this source.

By advocating the use of anti-hog cholera serum in healthy herds of swine the veterinarian would assist greatly in preventing outbreaks of cholera, which are still unnecessarily numerous and costly. In brief, the veterinarian should proceed more along the lines of preventive medicine than he has done in the past.

When visiting a farm professionally he can easily drop a few pertinent suggestions about improved sanitary conditions around the stables and barnyard. He can tell of the advantage of an all-year-round supply of sanitary drinking water, the saving possible through the use of concrete floors in stables, yards, and feed lots, the use of concrete water troughs, sanitary storage tanks and mangers. He can suggest how easy it would be to lay tile to drain the sink hole near the barnyard to the great advantage of both the human and animal population on the farm. He should be able to tell the farmer the advantage of a farm system of electric lighting, a pressure water system for residence, buildings, and feed lots, and the life-saving necessity for a sanitary sewage disposal system through the use of a septic tank. In brief, the veterinarian should know how to help farmers live safer, saner, cleaner, and better lives on the farm.

An unreasonably large number of market live stock reaching the packing house suffer from preventable disease, emaciation, or mechanical injury, resulting in enormously depreciated value in the meat product from these animals and material reduction in the national food supply. The practicing veterinarian by advice and suggestion can do much to remove the untoward factors involved which, in the aggregate, would mean immense salvage of exportable meats now so urgently needed.

#### CO-OPERATION IN LIVE STOCK IMPROVEMENT.

As an illustration of what the veterinarian can do in assisting live stock improvement, we have undertaken, as a demonstration experiment, to help grade up beef cattle in a certain county in the Central South.

We called on the State Veterinarian of that state for assistance. He has detailed five assistant State Veterinarians in that

county to locate farms on which we shall place pure-bred beef bulls. These local veterinarians will periodically inspect the animals and premises and advise with the farmers how best to feed and care for these bulls for profitable results. The mere announcement of this work has proved a great stimulus to live stock improvement over the entire state.

Commercial live stock interests recognize in the honest skilled graduate veterinarian a staunch friend and ally absolutely essential to the safe and permanent conduct of their business. Intimate daily contact with officials of the U. S. Bureau of Animal Industry, State Live Stock Sanitary Boards, and State Veterinarians has served only to increase our esteem and appreciation of the power for good in the intelligent veterinarian who sincerely devotes his life and effort to the betterment of this vitally important industry.

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## VITAMINES AND NUTRITION.\*

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PIERRE A. FISH, Ithaca, New York.

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The importance of little things in science has grown as research has increased. Only thirty or forty years ago it was not uncommon to hear and read of the Germ Theory of Disease. It is now an obsolete expression, but we are still in the shadow as regards ultra-visible germs.

The animal organism is extremely sensitive to certain substances in minute quantities. A striking example is that furnished by the suprarenal glands. Their removal is attended with fatal results. The active constituent of these glands—adrenalin or epinephrin—is present, under normal conditions, only to the extent of one part in 100,000,000 parts of the blood, and yet this infinitesimal trace is essential to life.

Research has shown that life cannot be maintained on an absolutely pure mixture of protein, carbohydrate, fat and salts. Comparatively recent evidence has shown that, in order to maintain the organism in condition, a small quantity of something not heretofore recognized must be present in the food. A ration, however well balanced and however well organized as to its

\* Read before the Veterinary Medical Association of New Jersey, semi-annual meeting, Asbury Park, New Jersey, July 12, 1918.

calorific or fuel value, is still deficient if this "something" is wanting.

Very many foods contain an exceedingly small but important amount of accessory substances, which have recently been shown to be essential for the growth, development and well being of the organism. When these substances are excluded from the food, the body suffers, and sooner or later becomes subject to various diseases. What these substances are and the role they play in the chemical changes of the body is the subject of considerable discussion and investigation. Various substances have been isolated whose presence in foods influences favorably the condition of the body and whose absence produces the opposite effect.

Among these substances or "accessory foods" are vitamines. The term vitamine was suggested by Casimir Funk in 1911. It is made up from the word vita (life) and amine, meaning an amine or chemical compound essential to life.

The disease known as beri-beri, a polyneuritis, was one of the first to be associated with the investigation of vitamines. This affection has been prevalent in those instances where the diet was exclusively or principally upon polished rice. It was found that a similar condition of polyneuritis with the same diet could be induced in pigeons and fowls and these forms served usefully for experimental purposes. If unpolished rice (with husk) was used the disease did not occur or if polished rice were fed and some of the husk or polishings later administered, health was maintained.

Funk has endeavored to isolate the substance (vitamine) which prevents beri-beri. From 100 kilograms of dry yeast, he prepared 1.6 grams of a crystalline substance, which if given in doses of 4-8 milligrams to neuritic pigeons effected a rapid cure in 2 or 3 hours.

Scurvy is another disease which occurs in man and certain higher animals when the diet does not contain fresh vegetables or fresh animal foods. Formerly epidemics of scurvy broke out on sailing vessels when the crew was forced to live for several months on such food as canned beef and dried cereals. During the siege of Paris in 1871 an epidemic of scurvy broke out in a portion of the population because of the lack of fresh food. This conception of the cause of scurvy is supported by the fact that a corresponding change of diet and especially the administration of fresh milk or lemon juice leads to a rapid recovery of most cases

affected by the disease. It is reasonable, therefore, to conclude that there exist in fresh food some substances which are essential for the prevention of scurvy and may be designated as anti-scurvy or anti-scorbutic substances. These substances, as already intimated, have no direct relation to the other known constituents such as proteins, carbohydrates, fats and salts.

From the practical point of view it is highly desirable to know something of the distribution of vitamines in the various natural foods. A quantitative method for estimating the vitamine-content of a given food unfortunately is not available at the present time. A relative estimate, however, is useful and this information is available in the following table as to antineuritic and anti-scorbutic properties:

ANTINEURITIC PROPERTIES		ANTISCORBUTIC PROPERTIES	
<i>Relatively Rich</i>	<i>Relatively Poor</i>	<i>Relatively Rich</i>	<i>Relatively Poor</i>
Brewers yeast	Sterilized milk	Fresh vegetables	Dried vegetables
Egg yolk	Sterilized meat	Fresh fruits	Dried fruits
Ox heart	Cabbage	Raw milk	Sterilized milk
Milk (fresh)	Turnips	Raw meat	Canned meat
Beef and other fresh meats	Carrots and other vegetables of this type	Cereals, sprout- ing	Dried cereals
Fish	Highly milled cereals		Pork fat
Beans			Starch
Peas			Molasses
Oats	Starch		Corn syrup
Barley	Molasses		
Wheat	Corn syrup		
Corn			
Other cereals			

It is an unfortunate fact that some of the foods richest in vitamines are more costly than those in which they are relatively poor. This is unfortunate especially in the large cities where in the poor districts at certain seasons, fresh eggs, fresh milk, beef, etc., are practically prohibitive financially. Much of the disease and malnutrition in these areas is doubtless due to the lack of these food accessories.

Although the presence in certain foods of unknown accessory food components has been pretty well established, it is a matter of considerable importance to determine their chemical nature and physiological action. Experiments have shown that the antiscorbutic and antineuritic substances could be extracted from certain foods by water. The antineuritic substances have also been found to be soluble in alcohol; as already mentioned in connection with yeast, this substance has been obtained in crystalline form, which yields on analysis, carbon, hydrogen, nitrogen

and oxygen. Although our knowledge of the chemical nature and physiological action of vitamines is still far from complete, a fact of fundamental importance is that they are fairly susceptible to temperatures above 100°C. (boiling temperature). Prolonged heating of most of the natural foods to a temperature of 120 degrees for one to three hours will destroy most of the physiological activity of the vitamines originally present in these foods.

On the physiological side, the evidence seems to indicate that without vitamines the food induces a toxic reaction more or less gradual in its effect; the best remedy for which is the antidotal action of the vitamines. The animal body is not capable of manufacturing the antidote or the known vitamines from vitamine-free food. (Antitoxins originate within the body; vitamines originate outside the body.) All of the higher animals, including man, receive their vitamine supply directly or indirectly from plants. It is the plant that synthesizes the vitamine and we obtain our necessary vitamine supply either by eating vegetable food or animal food. Cows store in their bodies the vitamines which they consume in their fodder; a portion of them is secreted with the milk, supplying the calf with the necessary vitamines, as well as furnishing a valuable source of vitamine for man. Chickens transfer part of the vitamine content of their cereal food into the eggs they lay. *It is the plant which keeps up the vitamine supply essential for animal life.* The wonderful synthetic power of plants is shown by their capacity of building up the vitamine from simple inorganic compounds. The fate of the vitamines in the animal body is not very well known. The body seems to have the capacity of holding fast to them for some little time. If a diet sufficient in vitamines is changed to one deficient or free of vitamine, it takes, as a rule, several weeks or even months before obvious and well-defined symptoms of deficiency diseases appear.

As already remarked, the animal organism is very sensitive to certain substances as exemplified by adrenalin, an animal product. Evidence seems to be growing that the animal organism is also very sensitive to a vegetable product, the vitamines and that we have, therefore, from vegetable sources, products which are just as essential for life and the well being of an animal as are the hormones or internal secretions.

With continued research, it is not impossible that vitamines may be isolated to such an extent that they may be used to sup-

plement a diet in which they are deficient, or utilized in a therapeutic way in deficiency diseases for curative purposes.

The effect of the war upon the health and food supply of a people may be sensed from the newspaper reports of conditions in the areas occupied by the Central Powers. Of specific conditions information is vague. With unbalanced, scanty rations with vitamine content ignored, deficiency diseases may be expected. Of these scurvy and beri-beri are best known, pellagra may be partially concerned and possibly rickets. Scurvy appeared in Glasgow and the English midland cities in 1916-17, when there was a scarcity of potatoes. Beri-beri was prevalent for a time during the siege of Kut when the white troops were on a ration of white flour. This disappeared when replaced by coarsely milled barley flour and Indian cereal grains. Scurvy broke out among the Indian troops in Mesopotamia as they did not eat the meat and horse flesh ration which protected the white troops from this disease. Substitution of fats deficient in the fat accessory for butter and diminution in the quantity of fat ration has caused outbreaks of xerophthalmia among children in the enemy countries and the increased amount of carbohydrates in the diet to make good the shortage in protein and fats has caused diminution in the growth of young children.

The health and food question is of vital importance to America as to other countries. The mistakes and experiences of others should be duly considered and profited by. It is not always necessary that the full picture of a deficiency disease should make its appearance. Such vague symptoms as loss of appetite and general weakness might very well, in some instances, be due to a deficient diet. It is quite possible that a number of indefinite complaints and symptoms of adults and children may be due to this cause and would be benefited by the administration of vitamines. The scientific and practical problems of stock raising will probably be very greatly benefited by researches on the effect of vitamines on the growth of animals and the composition and nutritive value of cow's milk. Efforts should be made to make use of certain industrial wastes rich in vitamines, such as brewer's yeast, rice polishings, etc.

It is an unfortunate coincidence that foods deficient in vitamines, which as a rule contain large amounts of, or are exclusively, carbohydrates, are cheap and abundant. The rising cost of foodstuffs induces the poorer classes, who cannot ration themselves intelligently, to ration themselves according to prices and

to unconsciously put themselves on a low plane of vitamine intake.

To the veterinarian the nutrition of animals is as important as the nutrition of the human to the physician. Although the domesticated animals are doubtless less susceptible than the human to so wide a range of deficiency diseases because of less interference with the natural ration in the way of cooking, etc., it is well to remember that a perfectly balanced ration of pure proximate principles or a ration properly constructed as to its calorific or fuel value is not sufficient to sustain life satisfactorily if the vitamine content is deficient. It has been reported that certain prepared foods have caused digestive disturbances. It is reasonable to infer that, as in human nutrition, vitamines must be considered. When research has advanced sufficiently it is not unlikely that it will be shown that dietetics play quite as important a part as therapeutics in safeguarding animal health.

It has been said that "Each country and each epoch has its own food problems." It is our duty to assist in the solution of them.

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### THE EXAMINATION OF THE EYE.\*

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R. R. BOLTON, Unadilla, New York.

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The practicing veterinarian is often requested to make an examination of the eyes of animals, especially of horses, because the horse is peculiarly susceptible to and frequently afflicted with a contagio-infectious disease which is very insidious in its nature, and which appears to affect only the eyes. Injuries often occur to the eyes of the horse as well as to the eyes of other species, and these take on a peculiar course in the process of repair, due to the highly specialized structures involved. An injury to the eye or the deranged sight of an eye following injury or following affliction with the insidious disease before mentioned gives the animal a repulsive appearance and makes it intractable. The presence of the contagio-infectious disease known as periodic ophthalmia or moon-blindness constitutes an unsoundness. For one to be able to differentiate injury of the eye from periodic ophthalmia

\* Read at the meeting of the Southwestern Tier Veterinary Medical Association, Binghamton, New York, July 5, 1918.

often requires a very thorough and careful examination of the entire structure of the eye.

Having a knowledge of the structure, anatomical relations, blood and nerve supply and physiological functions of the parts of the eye, an examination naturally divides itself into two parts, as follows:

- A. Examination of the exterior;
- B. Examination of the interior.

*Examination of the exterior* of the eye is done by two methods: I. Inspection, and II. Palpation.

I. Inspection consists in a scrutinizing examination of all those parts visible to the unaided eye and should be done in shaded daylight, not in direct sunlight. The eyes are observed in comparison with each other or with a pair of sound eyes and the following parts noted:

- (1) Prominence of the eyes. Are the two eyes of equal prominence? Is the prominence of the eyes normal?
- (2) The Palpebral Fissures. Are they equal in size, symmetrical and regular in contour?
- (3) The Eyelids. Are they symmetrical, faulty in form, position or movement?
- (4) The Eyelashes. With eyes open, the eyelashes of a pair of healthy eyes in the horse project nearly horizontally from the vertical plane of the side of the head. They incline very slightly downward from the horizontal. In a pair of healthy eyes the direction of the eyelashes are symmetrical with each other.
- (5) The Membrana Nictitans. Only the pigmented margin of the membrana nictitans can be seen at the internal canthus of the healthy eye. The margin of each should be regular, symmetrical and thin.
- (6) The Conjunetiva. The conjunctiva is inspected to determine the condition of the circulation in the eye. Two systems of blood vessels may be seen in the bulbar conjunctiva: the *conjunctival* and the *ciliary*. The *conjunctival* system consists of numerous irregular, fine tortuous vessels which anastomose frequently and which move with the mucosa when pressed aside on the bulb. In health the conjunctiva is pale pink and only a few fine pink vessels are seen. The *ciliary* system consists of larger vessels which ramify in straight lines over the eyeball from near the margin of the cornea and do not move on

the eyeball when pressure is exerted sidewise on the bulb. In eyes devoid of pigment there may be seen a narrow zone of white around the margin of the cornea, which is limited by a line of points on the sclerotic where the ciliary vessels perforate and traverse the sclerotic to the ciliary body. In conjunctivitis the conjunctival vessels are enlarged, numerous and tortuous and the conjunctiva is reddened and swollen. In iritis and inflammation of the ciliary body the ciliary vessels are enlarged and may be seen as red lines over the bulb accompanied with sensitiveness to pressure on the bulb.

- (7) The Cornea. The cornea is a smooth, transparent and glistening membrane with a uniform and regular convexity. In health no blood vessels can be seen.
- (8) The Aqueous Humor. The aqueous humor is a collection of lymph maintained within the eyeball between the posterior surface of the cornea and the anterior surface of the capsule of the lens. In health it is perfectly transparent.
- (9) The Iris and Pupil. To inspect the iris and pupil satisfactorily place the animal inside with his head near a window or an open door so that the light falls directly in his face. All openings admitting light to the rear of the animal should be closed so that when the observer stands in front of the animal looking at the eye no ray of light may interfere with his vision. In shaded daylight the healthy eye shows a black horizontal pupil bordered by the iris, the free margin of which is even and regularly oval in the horse and ox, while in the dog it is circular. In a pair of healthy eyes the pupils are symmetrical and equal in size. The iris is a pigmented muscular curtain, the muscle fibers of which are arranged circularly and diametrically. In strong light it should contract promptly, thus contracting the pupil, and expand as promptly in darkness, thus dilating the pupil. To examine, cover one eye with the hand so as to exclude the light, then cover the other eye for a minute or so and quickly withdraw. The pupil should be dilated when the hand is withdrawn and should promptly contract until proper accommodation is secured. Any failure to show these movements implies a lesion in the brain, optic

nerve or eye which impairs or paralyzes vision. The various causes of immobility of the iris are:

- (a) Permanence of the pupillary membrane which has remained from the fetal condition.
- (b) Adhesion of the iris to the capsule of the lens (posterior synechia).
- (c) Adhesion of the iris to the cornea (anterior synechia).
- (d) Glaucoma, in which intraocular pressure determines dilation of the pupil.
- (e) Iritis (inflammation and swelling of the iris). In this the pupil is narrowed.
- (f) Lesions of the oculomotor nerve may paralyze the iris and fix the pupil.

(10) The Corpora Nigra. These are especially prominent in the horse's eye and are smoothly rounded bodies, pigmented like the iris and attached to the horizontal margins of the iris from which they project outwardly. They are largest\* on the upper horizontal margin and may also be seen on the lower horizontal margin.

II. Palpation consists of feeling the eye with the hand or finger tips. The tension, sensitiveness and temperature of the eyeball are to be noted by this method of examination. Both eyes should be palpated simultaneously for comparison. To determine the tension and sensitiveness, the simplest and most practicable method is to place the index finger of each hand upon the upper lid of the eye and press inward upon the eyeball. All normal eyes have about the same tension, but a pair of healthy eyes have the same tension. A pair of eyes may differ in tension, depending upon whether one has been subjected to chronic disease and the other has been comparatively free from it. When sensitiveness is elicited on palpation of the eye, it is always indicative of an acute inflammatory condition within the globe. The temperature of the eye may be determined most easily by covering the eyeball with the palm of the hand. Increased temperature accompanies an acute inflammatory process.

*Examination of the Interior of the Eye* depends for the most part upon inspection and upon being able to look into the interior of the eyeball through its transparent media. There are three methods in use for such an examination as follows:

#### I. The Use of Mydriatics.

## II. The Examination for Purkinje-Sanson Images.

## III. The Use of the Ophthalmoscope.

I. *The Use of Mydriatics.* A mydriatic is any drug that when applied locally to the eye in the form of eyedrops (solution) possesses the physiological action of dilating the pupil through paralysis of the ciliary muscles and iris. During the action of the drug the power of accommodation is lost.

The use of a mydriatic is the first step preparatory to making an examination of the interior of the eye. If after the application of a mydriatic, dilation of the pupil cannot be obtained, we cannot proceed with any further examination of the interior of the eye, such as an examination for Purkinje-Sanson Images, or by the use of the Ophthalmoscope, because these methods of examination depend upon our being able to reflect and project rays of light into the fundus of the eye to illuminate it. Any examination of the interior of the eye attempted without first having secured paralysis of the iris and dilation of the pupil is unsatisfactory because the projection of light into an unprepared eye causes the iris to contract strongly and the pupil to close to a narrow opening so that structures back of the iris cannot be seen.

Observation of the action of a mydriatic drug upon the eye gives useful information as to the condition of certain structures within the eyeball. Dilation of the pupil may be prohibited by any one of the following:

- (a) Adhesions between the margins of the iris.
- (b) Adhesions between the iris and the capsule of the lens (posterior synechia).
- (c) Adhesion between iris and cornea (anterior synechia).
- (d) Infiltration and swelling of the iris.

The following drugs are mydriatics and are used as described:

(1) Atropine sulphate. This drug is in most common use as a mydriatic because it is most generally available and is most persistent in its action. The nitrate, salicylate, or borate, of atropine may be used.

For eye work atropine is usually employed in a 1% solution (atropine sulph. gr. 1, aqua dest. 5 ii). Fresh solutions should always be used. One or two drops are lodged in the pouch of the conjunctiva under the lower lid, whence it is absorbed through the cornea and into the aqueous humor to act directly upon the iris and ciliary body. In healthy eyes a full effect is obtained in one hour and often remains twenty-four hours. Accommodation re-

mains imperfect as long as eleven days. On diseased eyes a larger amount may be required and where adhesions of the iris (*synechia*) are present dilation of the pupil may be impossible.

To produce a maximum effect upon the iris, where it is desired to break down adhesions, ten drops of the atropine solution should be instilled into the eye, with an interval of five minutes between each drop. In this way the accumulated effect of all the drops is obtained. More than one drop can hardly be retained in the conjunctival sac at a time.

The use of cocaine (2% solution) along with the atropine insures a maximum dilation of the pupil. The best mydriatic prescription is the following, according to DeSchweinitz:

R Atropine sulph.....grs. iv  
Cocaine hydrochlor.....grs. viii  
Aqua. dest.....<sup>5</sup>i  
M. Sig. Use as eye drops.

A drop of the above solution into the eye once or twice daily will maintain a maximum dilation of the pupil in severe inflammations of the eye.

(2) Homatropin. This drug is weaker than atropine and the effect does not last as long. To use the drug properly it must be employed in 2% to 4% solutions, one drop of such solution being instilled into the conjunctival sac every 15 minutes for an hour and a half. The effect remains three days.

(3) Scopolamin. This drug is employed in  $\frac{1}{2}\%$  solution. Two instillations of one drop each, 30 to 45 minutes apart, are sufficient. Dilation of the pupil is complete in 30 minutes after the second instillation. The effect remains five to six days.

(4) Cocaine hydrochloride. Cocaine is a mild mydriatic and is used in 2% to 4% solutions. It seems to be an excellent synergist to atropine, and in eye work is most commonly used in conjunction with atropine as in the prescription above. Cocaine causes contraction of the blood vessels of the iris.

II. *Examination by Purkinje-Sanson Images.* Examination for the Purkinje-Sanson images is made to determine the transparency of the cornea, aqueous humor, lens and lens capsule. The transparency of the lens and lens capsule constitutes the most important object of this procedure because it is the simplest and most practicable method of determining the existence of cataract.

In order to make the examination it is first necessary to instill into the eye a mydriatic and obtain complete paralysis of the iris and dilation of the pupil. Second, darkness or semi-darkness

and a candle light or any artificial light of low illuminating power which is freely movable must be available. The value of the examination is based on the following: If, in a darkened room a lighted candle is passed back and forth at a suitable distance (4 to 6 inches) in front of a healthy eye, the pupil of which has previously been dilated, and an observer looks into the eye obliquely, he will see within the pupil three images of the candle flame reflected, respectively, the first from the external surface of the cornea, the second from the anterior surface of the lens, and the third from the posterior surface of the lens. The image from the front of the cornea (first) is erect, bright and clearly defined; the image from the front of the lens (second) is still erect, slightly larger, and dimmer than the first, because the difference between the index of refraction of the aqueous humor and the lens is very slight; and the third, that from the back of the lens, is smaller, clearer and more distinct than the last (second), and is inverted, because the surface of reflection on the back of the lens acts as a concave mirror.

The first and second images are also seen to move in the same direction that the lighted candle moved, while the third image moves in an opposite direction.

Any unevenness or opacity at any point on the three reflecting surfaces will cause the image reflected from that point and also the images reflected from surfaces posterior to become blurred, diffused or obliterated, depending upon the intensity of the opacity. Thus, not the existence only, but the exact seat of an opacity is easily demonstrated.

Opacities of the cornea cause a blurring of the first image, and a diffusion or obliteration of the second and third images. Opacities in the aqueous or on the anterior surface of the lens blur, diffuse or obliterate only the second and third images. Finally, opacities in the body of the lens or on its posterior surface blur, diffuse or obliterate only the third image.

### III. The Use of the Ophthalmoscope.

The Ophthalmoscope is used to determine the condition of the deeper structures, i. e., those structures posterior to the lens and iris.

This is only possible when the cornea, aqueous and lens are transparent and the pupil can be dilated. (Use of mydriatics.)

In a healthy eye no object back of the iris can be seen by an observer with his eye unaided, which is due to the fact that the background of the eye being examined is not illuminated.

Whenever we project rays of light into the background of an eye so as to illuminate it and are able to bring our line of vision in the same line with the projected rays of light, it is easy to see the background. This is best accomplished with an ophthalmoscope, which is a small, concave mirror having a hole in the center through which the observer looks, thus bringing his line of vision in the same line with the rays of light reflected from the mirror into the background of the eye and illuminating it.

In order to use the ophthalmoscope efficiently the pupil should first be dilated by the application of a mydriatic and the subject placed in a darkened room with a single flame of an oil lamp or candle or an electric light of low candle power. The light should be held stationary and in such a position that its rays may be reflected into the eye of the subject with ease to the observer. The ophthalmoscope is held close to the eye of the observer and at a distance of 10 to 20 inches from the subject's eye. In focusing a reflected light on the cornea and then on the pupil, lens or vitreous, any opacities in these will appear as grayish, cloudy reflections or a denser white, according to their degree of opacity. Opacities in the cornea or aqueous move in the same direction as the eye rolls, while opacities in the vitreous move in the direction opposite to the motions of the eye, so that by the aid of the ophthalmoscope it is not only possible to determine the presence of opacities in the transparent media of the eye but also to locate them with accuracy. Furthermore, an examination of the retinal circulation and of the optic papilla is possible.

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—Dr. G. E. Golden, recently in charge of Hog Cholera work in Louisiana, has been transferred to similar work at Des Moines, Iowa.

—Dr. J. D. Townsend, of Mississippi, who has been doing tuberculosis eradication work in Louisiana, on the force of Dr. R. W. Tuck, has resigned to take up the breeding of pure-bred cattle near Shreveport, Louisiana.

—Dr. A. E. Eschenbacher has resigned his position on stock yards inspection work of the B. A. I., at New Orleans, Louisiana, and is now in private practice at Arabi, Louisiana. Much of the Doctor's time is occupied in tuberculin testing of dairy and breeding cattle coming into Louisiana.

## **PARSING THE VETERINARIAN. (PAST, PRESENT, AND FUTURE.)**

**T. P. WHITE.**

Is there any one of us who fails to remember the mingled feelings of importance and anticipation running riot the day we received diplomas acknowledging to the world that having complied with prescribed studies, etc., of a certain seat of learning we were duly accredited veterinarians? And do you recollect the deep (and lasting?) impression made upon the graduating body through the remarks of those chosen to outline on that memorable day the duties devolving upon this exceptional class of graduates, to depict the grandeur of the noble profession we were entering, the wonderful future just unfolding to men as well fitted as we, and the bright career awaiting us in our chosen field of endeavors? As one of our cartoonists would put it: "Wasn't it a Grr-a-nn-d and Glo-o-ri-o-us feeling!"

Then came the rude awakening! A sordid and unsympathetic world refused to accept us at our worth unless we proved by deeds and not words that our services to a community were worthy of the confidence, trust, and remuneration solicited. Under such requirements how many of us proved to be a keen disappointment to the institution from which we came, to the professor whose special charge we had been and to the profession which had so generously taken us into its bosom, to say nothing of the disappointment to ourselves, verging on the point of belief that an error had been made in the selection of a mode of livelihood.

There is a saying that one's life and opportunities are largely what we make them. Granted this to be true in many cases, we must not fail to apply the well-known axiom that there are exceptions to all rules, and particularly in the case of the veterinarian. In the majority of instances the new graduate in veterinary medicine seeking a location wherein to practice his science has been more or less a victim of circumstances, oftentimes having been stalked by a ghost of the past, a specter of ill omen, as it were, in the shape of an incompetent practitioner or quack who for years had foisted his presence and illiterate practices on the

community. True, the veterinary fledgling had been told, warned and admonished that his success would depend upon his ability to overcome obstacles and adversities, but somehow, when faced with the concrete problem it became a more serious task than when discussed in the lecture room. The newcomer in the field of practice who had the wisdom to choose a rich man for his father and whose equipment, food and laundry money came from the perennial source oftentimes weathered the storm and emerged from it all victorious to become later a substantial citizen. A few, very few, without money but endowed with unlimited confidence in themselves (a trait very essential in the makeup of all veterinarians) managed to hang on till some unlooked-for incident established their standing and ability to render efficient service. Today, however, we see the prejudice and suspicion toward the veterinarian disappear and it is pleasant to note that his presence and services are solicited by almost every community and he is hailed as a useful member of society.

The so-called veterinarians of the past, whose only legacy left to the succeeding generation is the opprobrious name of "horse doctor," thanks to a kind Providence, is fast becoming extinct. The age of checkered suits, the derby hat perched on one ear, and black cigars which in proper place were tilted at an angle of 45 degrees, is only a memory, and with the passing of public gambling at race tracks and questionable dealing in horse flesh the profession has been purged of griping obstructions to progress and the application of science. However, let us not overlook the fact that veterinarians of today are indebted to many students and leaders in veterinary problems who lived in that dark age but whose scruples and principles plus scientific thoughts and training have laid the foundation of veterinary science upon a sound basis. To those, as pioneers, our thanks are due and given with true sincerity.

The practicing veterinarian of the present is profiting in a large degree by the error or limitation of those of the past. He has learned the necessity of being trained and qualified to affiliate with the various interests common to a locality. His views are broader, his sympathies keener, joining and giving freely of his advice and help in any movement for the benefit and upbuilding of the community of which he is a part. He has progressed from a livery stable as official headquarters to a well-appointed office on one of the principal streets. We find him representing his neighbors in local councils. He is becoming identified with civic

improvement movements. He has a comfortable residence. His family moves in society. In short, he is (as well he should be) one of the progressive and leading citizens.

It becomes necessary to digress somewhat from the main theme to call special attention to a group of veterinarians which heretofore has figured but little, or in a limited way, in the councils, organizations and plans of the veterinary profession. Reference is made to the large number of these professional men in the employ of the Federal Government. In their sphere, as sanitarians, in the detection and destruction of disease-infected meats, in the eradication of infectious and contagious diseases of live stock in the field, and in the various phases of work to which they are assigned, they, without a doubt, render the greatest good to the general public of any servant in the employ of the country. For reasons over which they have no control this army of loyal and efficient veterinarians has been overlooked, their work as professionals even discounted in certain quarters. Figured in the amount of public protection afforded by the work of these officials of the Government, both in the safeguarding of human health and in the prevention of losses from animal diseases, their services are probably of more value than those of any other class of employees, not excepting the veterinarians of the Army. And yet the fact remains that considering the class of service rendered, the objectionable conditions under which they are compelled to labor (for manual labor is part of their duties) and long hours engaged they are the poorest paid class of employees on the pay roll of Uncle Sam. It is a matter of record that laymen, even women, are employed by the same Department at salaries much in excess of those paid these veterinarians, many of whom have served faithfully for a considerable number of years. This is no reason why the layman, or laywoman, should receive less, but additional reason why the veterinarian should receive more. Where the responsibility lies for this condition is not for the writer to know or say, but the fact that these employees are faithfully performing their tasks under the present rate of compensation is a lasting monument to their loyalty and frugality.

Coming back to the main topic and the parsing of the subject, the veterinarian of the future will necessarily be a sanitarian in addition to other qualifications. We are entering into a period of prophylaxis and the application of sanitary measures and formulæ in the prevention of diseases of animals as well as of the human family will be the chief factor in the protection of health. The graduate of the future must be trained as an educator as well as

practitioner. He must be qualified to address public gatherings; he must have knowledge of types of sanitary buildings and their construction, drainage system, etc. Animal husbandry will be required as part of his veterinary training, and what is more useful than a knowledge of scientific agriculture to make him popular in a farming community? A public able to judge the value of science will demand a truer system of diagnosis of ailments which will require laboratory tests in many cases. Therefore, the practitioner of future years will need to be qualified and equipped to make such tests. As immunization will constitute a large part of treatment, it will be to his advantage to make his own bacterins and vaccines, especially those of an autogenous character.

This may seem like a fantastic figure I have described as a future veterinarian and some may think it too big a proportion to attain. Ours is a big profession, confined in the past within narrow limits. It must expand with the balance of world factors and as it appropriates its rightful functions in a sphere of science we must look to the individual member to assimilate the necessary knowledge to keep the veterinary problems and ethics abreast of other professions engaged and concerned in making this habitation of man a better place in which to dwell.

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## ORGANOTHERAPY AND THE CLASSIFICATION OF THERAPEUTIC TISSUE EXTRACTS.\*

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Owing to the rapid and constantly growing interest in Organotherapy, or as it is sometimes called Opotherapy, the time seems opportune to submit for discussion a brief review of some of the known facts demonstrating the need of more study and investigation, not only in the laboratory but by clinicians, with a view of clearing up some of the problems and obscurities connected with this therapy.

The need of further study is obvious when we realize that with few exceptions the therapeutic use of tissue extracts is more or less empirical and while the modern physician or veterinarian

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\* Read before the California State Veterinary Medical Association, June 12, 1918.

is inclined to sidestep anything savoring of empiricism, yet there is sufficient data available both experimental and clinical to justify him to increased use of these agents until such a time as through the media of research and laboratory investigation more definite information is acquired.

It is with this incentive in mind we are prompted to do our bit toward stimulating the study of this most interesting subject.

We are also prompted at this time to endeavor to arrange the various types of tissue extracts, and tentatively classify them in such a way that the clinician may become better acquainted with the physiological or chemical characteristics of these therapeutic agents and thus be guided as to their selection and the indications for their use.

The old, time-worn theory that the nervous system was entirely responsible for functional activity is rapidly being supplanted and the nerves are gradually being relieved of the various responsibilities that were formerly forced upon them. While it is not denied that the nerves do perform some mission in the control of metabolism, yet it is now definitely known that metabolic changes are directly controlled by certain secretions, some of which have a direct influence upon the tissues in which they are formed and others which act indirectly as "Hormones"—that is to say, on tissues or organs far removed from their source.

In emphasizing this statement we believe we can best serve our purpose by quoting from Harrower's recent work on *Practical Hormone Therapy*, in which he lists a few of the known and unknown hormones, which probably constitute the active principle or principles of tissue extracts at present available.

#### "THE PRESENT LIST OF KNOWN AND UNKNOWN HORMONES."

"By 'Known hormones' are intimated those principles the presence of which is presumed because of definite action caused by the organ producing them; they are not necessarily capable of isolation or even of standardization.

The substances of known composition which may be regarded as playing the role of hormones are few in number—three or four at most—as follows:

The carbon dioxide formed in the tissues, particularly in muscle during contraction. It seems agreed now that the carbon dioxide acts as the normal stimulus to the respiratory centre. When produced in the working muscles in such quantities as to raise perceptibly the carbon dioxide tension in the alveoli of the lungs and the blood of the pulmonary veins, the respiratory centre is excited to greater activity, and the excess above the normal contents is thereby removed.

The adrenalin of the adrenal glands, which in some way, directly or indirectly, makes possible the full functional activity of the involuntary musculature of the body.

The hydrochloric acid produced in the stomach, which stimulates the formation of secretion in the duodenal epithelium.

Possibly the iodothyronin of the thyroid gland with its dynamogenic effect upon the neuromuscular apparatus of the body.

In addition, there are a number of hormones of unknown composition which have been either proved or assumed to exist, and which are held responsible for certain well-known correlations of function.

The pancreatic secretin formed in the epithelium of the duodenum or jejunum, which stimulates the flow of pancreatic secretion.

The gastric secretin formed in the pyloric mucous membrane, which gives rise to the chemical secretion of gastric juice.

A secretin formed in the duodenal epithelium, which stimulates the formation of intestinal juice in the following segments of the intestine.

Unknown hormones of pancreatic origin, which determine the absorption activity of the intestinal epithelium.

Vaso-dilator hormones formed in tissues in functional activity, and which have a specific effect upon the vessels of the functioning organ.

A vaso-constricting and diuretic hormone formed in the posterior lobe of the pituitary body.

A hormone controlling the growth of the bones and connective tissues produced in the anterior lobe of the pituitary body.

A hormone controlling the oxidation of sugar in the body and produced in the cells of the islands of Langerhans in the pancreas.

A hormone produced in the thymus, which controls possibly in some way the development of the reproductive organs.

A vaso-constricting hormone formed in the kidneys.

A hormone in the salivary glands, which controls the flow of water from the blood-capillaries in the glands.

A hormone produced in the foetus in utero, which stimulates growth of the mammary glands.

A hormone in the ovary, which controls the growth of the uterus and the processes of menstruation.

A hormone in the ovary, which controls the implantation of the fertilized ovum and the growth of placental tissue.

A hormone in the testis, which initiates the development of the secondary sexual characteristics in the male.

Hormones of an indefinite number, produced in all the tissues and acting specifically upon the determinants in the gametes in such a way as to make possible the transmission of acquired characteristics."

From the above data it is apparently well established that the various functions of the body depend largely, if not entirely,

upon certain substances or secretions, some stimulating and some inhibitory in character, whose sources are the so-called ductless glands or other tissues. It has been found upon study that some of these secretions are stimulating in character-producing or activating ferments, while others are inhibitory-producing or activating antiferments, one type serving to control the other within normal limits. In other words, one secretion furnishes the motive power which drives functional machinery, while the other type acts as a governor.

It is obvious therefore that a certain balance of these secretions must be maintained or else the normal metabolic order of things is upset and pathological changes result.

If this be true, it should be the duty of every physician and veterinarian to aim to recognize a disorganized balance and to endeavor to correct same by the judicious administration of a tissue extract containing as its active principle a hormone that will restore and subsequently maintain the normal equilibrium so essential to proper cellular function.

In the use of tissue extracts, however, it is suggested that great care be observed by the clinician, particularly in selection, as the constant use of some types of tissue extracts has a tendency to promote a lack of tone or a condition of laziness in the tissues or cells receiving artificial support.

From a therapeutic standpoint let the use of cod liver oil be used to illustrate the practical benefit of hormone therapy. It is a well-known fact that cod liver oil is markedly efficient in the treatment of various pathological conditions, more especially tuberculosis and diseases of a similar type. A study of the reason for the therapeutic effect of cod liver oil reveals the fact that its benefits cannot be ascribed to its fat content, which is no more useful than fats from other sources, but its therapeutic value is undoubtedly proven to be vested in certain liver secretions of the liver of the cod which are contained in the oil.

In fact, actual clinical experiments have demonstrated that when certain substances lecithide and hormone in character are isolated from cod liver oil, upon administration the same physiological benefits are derived as when the whole oil is used.

By tissue extracts are meant extracts or solutions of the non-protein, soluble digestion products of normal tissues or organs, which if properly prepared produce definite anatomical changes or physiological changes or both in like organs or as hormones in organs of another fixed group.

The tissues or organs which serve as sources of these extracts may, with the active principles which they furnish, be divided into two mains groups: *First*, those organs or tissues containing an active principle with a chemically firmly fixed atomic balance, which makes it extremely difficult to upset the relations of the elements within the molecule by physical means such as heat; *Second*, others whose active principle or principles are chemically more loosely bound and hence more active. These substances are so constructed that certain physical influences, notably the application of heat, alter the internal relations of their elements, upsetting the balance otherwise maintained by molecular attraction and permitting of rearrangement. Under these conditions there results a substance whose physiological characteristics have been lost, even though it be chemically identical with the substance from which it arose.

The first group—namely, those unaffected by heat—are chemical entities, which may be separated from the surrounding organic material and crystallized, and which have an action closely allied to the action of certain drugs, particularly the alkaloids. Under this head should be placed epinephrin, thyroidin, and tethelin. The administration of these substances are followed by functional changes only. Members of this group are highly toxic in character and when given continuously or in single large dose are extremely poisonous and may even cause death.

To the second group belong a class of substances whose use can in no way be compared with the use of drugs but which produce changes more nearly paralleling normal physiological processes, stimulating not only functional activity of a limited number of cells, but also cell reproduction, with a resulting increase in the number as well as the activity of the cells involved. Unlike the first-mentioned class of tissue extracts, they are not toxic and even when administered to normal individuals in large doses have no deleterious effects. To this class of extracts belong Leucocytic Extract, Lymph Gland Extract, Ovine Lymphoid Tissue Extract, Spleen Extract, Ovarian Extract and Testicular Extract, etc.

The characteristics and therapeutic application of extracts of thyroid, pituitary and adrenal glands are well known and these products are extensively used by a majority of practicing physicians and veterinarians today.

Much work has already been done in the study of group two, but there are undoubtedly many organs and tissues not yet

worked upon which contain substances of this class. It is highly probable that such organs as the thyroid, pituitary and adrenal glands contain, aside from the principles of known therapeutic value, members of this chemically unstable group, which are destroyed in the preparation of the more stable compounds.

It is reasonable, therefore, and logical, to assume that the drastic methods resorted to in obtaining certain extractable substances from tissues, such as boiling or chemical treatment and subsequent refinement may, and as we propose to show do, deprive the finished products of many of their virtues.

In evidence of the fact that excessive heat is somewhat detrimental even to the more stable types of substances such as epinephrin the following set of experiments may be cited:

A number of bovine suprarenal capsules free from fat and surrounding foreign tissues were finely ground and the mass

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diluted with four times its weight of — HCl, heated at 58°C for  
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one-half hour, iced for sixteen hours, incubated for eight hours at 37°C and finally filtered through paper. The filtrate was divided into two parts, the first remaining untreated, the second being boiled exactly two minutes, after which it was quickly cooled and filtered.

The two solutions were then tested in graduate doses, ranging from 2 cc to 0.2 cc per Kilo on rabbits for their ability to produce glycosuria, which test is a fairly accurate measure of the potency of the extract, the physiological activity of which is inversely proportional to the dose and the length of time between its administration and the appearance of sugar, and directly proportional to the quantity of sugar excreted, all other factors being equal. The most active extract is, therefore, that extract which when given subcutaneously produces the most marked glycosuria with the smallest dose in the shortest time.

In the entire series of experiments the extract which was not boiled produced the most marked glycosuria in the shortest time and with the smallest doses. The boiled extract in the maximum dose caused the excretion of about 0.7% of sugar excreted by an animal receiving the same dose of the unboiled portion in triple the time. The boiled extract is, therefore, less than 1/300 part as active as that made by the same process but at no time heated above 60°C.

Similar tests repeated at weekly intervals show that the extract which was boiled loses its power to produce a glycosuria

after two weeks, while the unboiled extract remains active after a year.

To summarize, then, the rationale of treatment with these substances which may be prepared by a proper digestion process, avoiding excessive heat is obvious when one considers the fact that their mission is to revitalize cells which have lost their normal vigor and are unable to produce their share of the substances necessary for normal metabolism and are hence either themselves the cause of the pathological condition or are directly responsible for the lowered resistance of the individual which has made infection or toxemia possible.

In the case of tissue extracts of group one, we simply administer substances which are the products of cell activity, and which are necessary to the normal well-being of the individual, but which have no permanent effect and must, therefore, be given continuously in order to maintain the condition desired. On the contrary, with extracts of group two we are using a substance which brings to the cells a product which enables them to regain their lost balance and to resume their normal physiological functions.

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## HEMORRHAGIC SEPTICEMIA, ITS CLINICAL DIAGNOSIS.\*

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DR. H. JENSEN

The clinical diagnosis of this disease is many times exceedingly difficult and can be arrived at conclusively only by a laboratory confirmation, which may necessitate the use of experimental animal inoculation. Hemorrhagic Septicemia, an infectious disease, attended with a high mortality, attacks various species of animals, especially Cattle, Sheep and Swine. Young animals are more susceptible to the disease than older ones and those that are thin and poorly nourished are most liable to be affected.

The disease is a pure septicemia or blood poisoning, and for this reason often runs a short course and the affected animals die suddenly. The sudden death and the high mortality, both of which are present in the beginning of the outbreak, are more or less confusing with Anthrax.

\* Presented at annual meeting of the State Veterinary Medical Association of Texas at College Station, July 29-30, 1918.

In Hogs, the disease is known as "Swine Plague," but I wish to state at this point that the true Swine Plague, which is caused by the organism *Suiscepticus* alone, is very rarely encountered in the field, but instead a disease which is commonly called Swine Plague but which is a mixed infection of swine. In swine this disease may become chronic and in such cases the affected animals gradually become weaker and thinner and may linger for several weeks before death.

Fowl Cholera represents the avian form of Hemorrhagic Septicemia and its attacks sometimes cause great losses; pigeons and geese are susceptible to Hemorrhagic Septicemia and usually results in death so quickly at the beginning of the outbreak that no forms of treatment have time to become effective.

#### PECTORAL, OR PULMONARY, FORM.

**SYMPTOMS.** The period of incubation in natural infections is probably, in the majority of cases, from 6 hours to 8 days. At first there is a rapid rise in body temperature to over 104°F., accompanied by a quickened pulse, dullness, rough coat and muscular tremblings. The most characteristic symptoms observed in this form of the disease are acute pleuro-pneumonia, the animal standing immovable with arched back, a dry, painful cough and a colorless or reddish foamy discharge from the nose. One or both sides of the thorax may show a dullness over different areas with bronchial breathing and vesicular rales, or there may be a total absence of respiratory sound. The respiration is greatly accelerated and labored, rumination ceases, peristalsis of the rumen and intestines is frequently suppressed. Constipation is followed by bloody diarrhoea, after which the weakened animal rapidly succumbs.

**ANATOMICAL CHANGES.** In the pectoral form of this disease the lungs will be dark in color and much thickened, with collections of blood serum in the meshes of the lung tissue, or they may be consolidated. The diaphragm, heart sac and heart will show numerous point and large hemorrhages. Occasionally we will find in conjunction with this form of the disease a hemorrhagic condition of the large and small intestines. On section of affected portions of the lung we often find areas of red and gray hepatization, having the marbled appearance seen in contagious pleuro-pneumonia and when squeezed exudes a yellow serum.

### SUBCUTANEOUS FORM.

**SYMPTOMS.** In this form of the disease we have some cases where the surface of the body feels alternately hot and cold while the muzzle is cold and dry. There is also cessation of the appetite, rumination and milk secretion, providing that the animal lives a sufficient period of time after infection to manifest the latter named symptom. Swellings will appear beneath the skin of the head, throat or dewlap. These enlargements are somewhat soft and pit on pressure. The tongue is often swollen and the animal drools and slobbers because of the irritation to its tongue and throat. Examination of the nostrils often reveals the presence of many small hemorrhages just beneath the lining membrane, the eyes become swollen, highly inflamed and as a result tears flow down the cheek. Swellings of the legs or inflammatory enlargements of the different joints may be observed. The skin over the swollen parts of the body is very tense, warm and sensitive, respiration is difficult and the animal breathes heavily, especially when the enlarged swellings occur in the vicinity of the throat. Due to this swelling some animals die of asphyxiation.

**ANATOMICAL CHANGES.** The characteristic lesions found in this form of the disease vary in the different individuals. All cases show some hemorrhagic areas in the subcutaneous tissue, though the number and size of these vary greatly. Some animals exhibit very few, while others, on removing the skin, present hemorrhagic areas or petechiae in large numbers and so extensive that a large fraction, possibly one-eighth, of the body surface appears to be involved. The large hemorrhages in the subcutaneous tissue appear to be of the composite type, which in some instances measure a number of centimeters in diameter, while in others a number of minute hemorrhages are placed closely together and may become partially coalesced. The subcutaneous swellings show the infiltration of a sero-fibrinous exudate which is usually yellow in color but has been found to vary from this to a dark red. Gas does not appear in the subcutaneous tissue of animals dead of this disease except in those cases where extensive postmortem changes have taken place. The blood vessels of the subcutaneous connective tissue, in the acute cases, show an extensive engorgement, but in those cases where the animals have lived until emaciation has taken place there is no engorgement of the blood vessels. The location of the superficial lesions varies in different animals. In most cases the parts about the shoulder are most affected, although a

few animals show marked lesions in the gluteal and inguinal muscles. At first sight the muscle tissue in some cases appears to be much involved, while on a closer examination it usually shows that some of the minute hemorrhages are in the muscle proper but that the larger are in the inter-muscular connective tissue. They are usually accompanied by a considerable quantity of yellowish or blood-stained serous exudate.

The lymphatic glands are frequently, though not uniformly, enlarged. Those that are enlarged are œdematosus or hemorrhagic. The cervical and pre-scapular glands are most seriously affected.

#### CUTANEOUS FORM.

**SYMPTOMS.** The cutaneous form of this disease, which was at first called "Mad Itch," is quite rare and apparently has never been seen in some sections. This usually manifests itself by the animal rubbing, showing intense itching and nervousness. This itching is of such an intense character that large areas of skin will be entirely devoid of hair and rubbed to a raw sore.

In all instances in which this disease occurs the fence posts, trees or any other objects which are accessible are covered with hair and blood as high up as the animal is able to reach. These animals usually die in from 12 to 72 hours. In this excitable stage many times it is difficult to differentiate this disease from Rabies or cerebral conditions, but upon blood examination typical bi-polar staining organisms will be found present.

**ANATOMICAL CHANGES.** In a great many instances the typical diagnostic anatomical changes in this form of the disease are wanting, but usually there is found small petechial hemorrhages to be present in the subcutaneous tissues. The heart, which is quite constant, shows petechial hemorrhages both in the muscle and in the fat about the base of the heart. There will also be found these same petechial hemorrhages scattered over the auricles, but for some unaccountable reason we do not get the hemorrhages over the ventricles towards the apex, as is found in many instances in other forms of this disease.

In examining the central nervous system it will be found that hemorrhages occur in the coverings of the brain and of the spinal cord and also that the spinal fluid will be of a more or less red tinge, showing that there have been pathological changes taking place in these centers.

### ENTERIC FORM.

**SYMPTOMS.** There exists at times the intestinal form in which changes are chiefly found in the abdominal cavity. This form of the disease may appear after it has already developed in the lungs. The intestinal form is usually accompanied with symptoms of colic and with much straining. Instead of the usual dry, dark brown feces, a mushy and finally a thin fetid fluid, which is frequently mixed with fibrin and mucous flakes, as well as with blood, will be found, although there are many instances in which the feces will be apparently normal from the standpoint of consistency and color, but will show a small amount of blood streaks; where, on the other hand, the mucous membrane of the intestine may be so badly inflamed that large portions of it will be expelled together with the feces, and the contents of the bowels in this condition may have the appearance of pure blood. The animals lose flesh very rapidly, the abdomen becomes tucked up and the eyes are quickly sunken; a staggering gait caused by the weakness of the patient is often noticed.

The intestinal form of this disease is very rarely encountered in certain sections. In most cases the animals show severe involvement of the lungs and the symptoms of croupous pneumonia.

**ANATOMICAL CHANGES.** The characteristic lesions of this form of the disease are generally most pronounced in the digestive tract. The stomach together with the large and small intestines will show hemorrhages both on the mucous and serous coverings. In some instances there will be found hemorrhages in the submucous tissues of both the large and small intestines, and cases have been reported in which the hemorrhages apparently extended from the surface of the serous coat to the inner surface of the mucous membrane. In the very severe forms of this disease, and especially those which have lingered over a great period of time, the intestinal wall will be found, for quite some distance, to be almost entirely devoid of the mucous lining. The contents of the intestines is usually thin or water-like and fetid. In many instances clots of blood will be found mixed with this fluid contents, while, on the other hand, in the very acute form of the disease, the intestinal contents will be approximately normal from the standpoint of consistency, but may be very dark in color, due usually to the decomposition of the extravasated blood.

Hemorrhages will be found in the mesentery and also the peritoneal lining of the abdominal cavity. The lymphatic glands

are usually highly congested or may also be hemorrhagic. The gastric surface of the diaphragm, in some instances, shows petechial hemorrhages, although they are not constant. The kidneys are very seldom affected, but when changes in the kidneys have taken place they usually consist of pinpoint hemorrhages and are mostly confined to the cortical surface, though a few are found in the walls of the pelvis and the uterus.

A disease has been described under the name of "Septic Pleuro-pneumonia of calves" which is a form of Hemorrhagic Septicemia and caused by the *Bacillus bipolaris vitulisepticus*. The symptoms shown by the affected calves are quite characteristic of Hemorrhagic Septicemia and the postmortem findings are also those found in that disease.

#### HEMORRHAGIC SEPTICEMIA OF SHEEP.

**SYMPTOMS.** In Sheep, young animals which have just been weaned are more susceptible, the disease manifesting itself in an acute form. There is a high temperature, muscular tremblings, discharge from the eyes and nose and colicky pains. The duration of the disease is usually very short, although it may become a chronic infection of the lungs with gradual emaciation of the animal. Sometimes the joints are involved, swelling of the knee joints being noticed in some cases.

The duration of the disease is usually about that of Cattle, viz., from 6 hours to 8 days, a high temperature is manifest, quickened pulse and dullness. The disease usually manifests itself in a more purely septicemic form than it does in the other animals.

**ANATOMICAL CHANGES.** In many instances the disease is of such an acute nature and the animals die so suddenly that the postmortem findings are wanting, but the changes which are usually present are petechial hemorrhages of the heart, lungs and spleen. The consolidation of the lungs may be encountered, but it is not a constant factor. The lymph glands will be highly congested and in many instances hemorrhagic, especially those in the cervical region.

#### HEMORRHAGIC SEPTICEMIA OF SWINE.

**SYMPTOMS.** In Swine, the disease sometimes manifests itself in a peracute form with the symptoms of general septicemia. Red spots may be noted on various parts of the body, especially around the ears and on the neck and rump. When affected with

this form of the disease the animal usually dies within a few hours after the first symptoms appear. In acute Swine Plague the disease usually occurs as a necrotic pleuro-pneumonia. There is labored inspiration, dry, spasmodic cough, slimy discharge from the nose and sometimes a pure conjunctivitis, cyanotic membranes, constipation, followed by diarrhoea and the feces sometimes containing blood. In the acute form the animals usually become emaciated and die in from 1 to 2 weeks. Sometimes the acute form develops into the chronic type, in which case the acute symptoms subside and the cough and pulmonary involvement continue for some length of time. Progressive emaciation occurs and a chronic inflammation of the joints may develop, resulting in the animal's death in from 3 to 6 weeks' time from exhaustion.

**ANATOMICAL CHANGES.** The most constant lesions which are present are the small petechial hemorrhages found scattered over the surface of the lung, the heart, pleura, diaphragm and lymph glands of the various parts of the body. The lymph glands which usually show the more pronounced changes are those of the cervical region together with the mediastinal glands. There are usually hemorrhagic areas present in the lungs; in some instances the entire lobe may be involved. On section these diseased portions may show either red or gray hepatization and in many instances large pockets of pus. The bronchi are filled with mucous exudate which is very stringy in consistency.

The contents of the intestines may be approximately normal in consistency but show small quantities of blood. The mucous membrane in this form of the disease is somewhat thickened and hemorrhagic. In a great many instances there will be found ulcers which have penetrated through the mucous membrane down into the walls of the intestine, to the submucous tissues. The spleen is usually normal in size and consistency but will show some hemorrhages on its surface. In some instances it has been found that typical petechial hemorrhages appear in the kidneys, which will cause great confusion between this disease and that of Hog Cholera.

#### DIFFERENTIAL DIAGNOSIS.

**IN CATTLE.** Because of the acute course, high fever and rapid termination in death from this disease in this species of animals, some difficulty may be experienced in distinguishing Anthrax, Blackleg, Malignant Edema and Rabies, from Hemorrhagic Sep-

ticemia. The œdematosus swelling of the throat or neck may be present in both Anthrax and Hemorrhagic Septicemia, but the examination of the spleen will usually determine the cause of death, due to the fact that the spleen is usually normal in animals dead of Hemorrhagic Septicemia, and enlarged and softened spleen pulp in animals dead of Anthrax.

Blackleg and Malignant œdema may be detected usually by the formation of gas within the swellings upon the body and the bubbles thus developed will produce a crackling sound under pressure. This gas formation is wanting in the swellings of Hemorrhagic Septicemia, providing the animal has not been dead for a long period of time before autopsy and decomposition have taken place. There is also another factor in Blackleg which is very characteristic: discolored muscle and the typical rancid-butter odor of the diseased muscle and the juices of the same.

In the cutaneous form of Hemorrhagic Septicemia and Rabies in cattle, the symptoms and duration of the disease are very similar but the finding of the hemorrhagic condition of the various organisms of the body and also the hemorrhages which usually exist in the coverings of the brain and spinal cord will differentiate this form of Hemorrhagic Septicemia from Rabies.

Hemorrhagic Septicemia of Swine, commonly called Swine Plague, appears in the form of pleuro-pneumonia. The symptoms of this condition may be confused with round worms in the lungs, which are identical with those of Hemorrhagic Septicemia, but the long course of the parasite disease should be taken as an indication that the pig is not affected with Hemorrhagic Septicemia.

The writer does not feel that true Swine Plague or Hemorrhagic Septicemia occurs very often in conditions in the field, but instead of a pure Hemorrhagic Septicemia we usually have present a mixed infection which consists of *B. suisepcticus*, *Staphylococci*, and *B. coli communis*. It has been stated many times that the *Bacillus necrophorus* plays a very important part in this disease, both in the pulmonary and the intestinal form, but I wish to take exception to these statements that this last named organism plays such an important part in this disease. This opinion is based upon the laboratory findings of a great number of specimens which have been recently examined at our laboratories and also upon the results which have been obtained in the treatment of this disease.

It is very difficult to differentiate between Swine Plague and Hog Cholera. The two diseases may exist at one time in the same animal and the postmortem findings in a great many instances will be found to be apparently the same, but a differentiating feature which should be noted in connection with these two diseases is, that in case the disease seems not to be of a very contagious nature and does not spread rapidly from one farm to another, the larvae of *Strongylus vulgaris* cause aneurisms of the great arteries. But, on the other hand, if it spreads very rapidly with a very high mortality, it is quite evident that you are dealing with Hog Cholera in these animals.

After carefully considering all of the above conditions, differentiating between various diseases, it is advisable to collect specimens of both blood and diseased tissue, pack the same in ice and forward to a reliable laboratory for a confirmatory diagnosis.

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## THE ANTHELMINTIC TREATMENT OF EQUINE INTESTINAL STRONGYLIDOSIS.

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Strongyles, including for the most part species of the genus *Strongylus* (*Sclerostomum*) and *Cylicostomum* (*Trichonema*, *Cylicostomum*, "Sclerostomum tetracanthum"), are very common parasites of the large intestine of the horse, and are regarded as rather serious parasites. The adult worms of the genus *Strongylus* are blood-suckers, as their red color indicates, and the habit of sucking blood produces here, as elsewhere, resultant anemic conditions and the associated lowering of vitality and of resistance to other injurious factors. The larval worms develop in various organs and tissues outside of the digestive tract and in the walls of the digestive tract, acting as foreign bodies and occasioning varying degrees of injury according to location. The larvae of *Strongylus vulgaris* cause aneurisms of the great mesenteric artery, and later pass, as agamic adults, to the walls of the cecum, where they form small cysts or abscesses. The larvae of *Str. equinus* usually occur in the liver, lungs and pan-

areas. The larvae of *Str. edentatus* are especially apt to occur under the serous membranes, the peritoneum and pleura, but may occur almost anywhere. The larvae of *Cylicostomum* occur in cysts in the walls of the large intestine. Verminous aneurisms are well known to veterinarians as the potential cause of sudden death by rupture, of intermittent lameness from embolism due to particles from the aneurism lodging in the blood vessels of the hind legs, and of verminous colic from embolism similarly occasioned occurring in the blood supply of the large intestine.

The symptoms resulting from infestation with these worms are diarrhoea, loss of appetite, emaciation, and anemia. Later the animal may show edema, joint infection, intermittent colic, or the other symptoms noted. The condition, like almost all worm diseases, is afebrile. The disease may prove fatal, become chronic as the result of injuries to tissues, or the animal may recover.

The noted French authority, Railliet (1915), states that it is difficult to expel parasites from the large intestine by oral medication in any host species, and this is the general view of parasitologists and veterinarians. It is quite decidedly the prevailing view as regards the expulsion of strongyles from the horse. Here the worms are remote from the mouth and associated with large masses of undigested material in a way that makes dilution of the anthelmintic certain and contact with the worms theoretically difficult. Somewhat to our surprise, our experiments showed that these worms could be removed with great certainty and with a high degree of efficacy as regards the number removed compared with the total number present. Inasmuch as our findings in these experiments are completed by postmortem examination, these results are dependable. Of course, occasionally failures must be expected, but strongyloidosis is more susceptible of successful treatment than has been thought.

Our explanation of the high degree of efficacy obtained in the removal of worms from the cecum and colon of the horse is that it is due to the increase in the time factor, as regards period of exposure of the worm to the anthelmintic. Anthelmintic efficacy is a product of certain factors—the potency of the drug, the amount of the drug, the contact with the worms, and the period of contact with the worms. In a general way, an increase in any of these factors increases their product, which is the anthelmintic efficacy. Food and drugs pass rather rapidly from the stomach and through the small intestine of the horse, but they lie for

comparatively long periods in the cecum and double colon. It seems entirely probable that the long period in which anthelmintics may operate in the large intestine is responsible for the high efficacy they attain. In this connection it should be noted that food enters the cecum of the horse through one aperture and passes out through another, a condition not present in such animals as the chicken, dog, swine, sheep, cattle, etc. In the latter animals, it is theoretically possible, and, in the case of the dog, entirely probable from the evidence of such anthelmintic experiments as those of Hall and Foster (1918), for drugs to pass the ileocolic or ileocecal valve to the colon without entering the cecum. This is not possible in the horse, so that drugs can be depended on to enter the cecum if they pass the ileocecal valve.

The method used by us in our experiments was the one already published by one of us (Hall, 1917) in connection with a study of the action of carbon bisulphide on bots. One of us (Wilson) administered the drugs, supervised the feeding and fasting of the horses and the collection of the manure and made the general postmortem examination. The others made daily collections and identifications of the worms from the manure, collected and identified the worms present postmortem, and noted the condition of the digestive tract postmortem. Worms were only identified as far as their genus, it being out of the question to identify species of *Cylicostomum* *Trichonema* from manure in work of this sort and unnecessary to do this or identify species of *Strongylus* in ascertaining efficacy. Our results do not indicate that any particular species shows any special resistance. The manure was examined daily, being picked apart slowly and carefully. This is a slow and tedious task, but entirely feasible. A few *Cylicostomum* are doubtless overlooked, but the oversights antemortem and postmortem probably offset one another, leaving the ascertained percentage of anthelmintic efficacy substantially correct. Rubber gloves were worn to protect the hands, but the task of examining manure thus is not so unpleasant as might be imagined. On postmortem examination, the contents of the large intestine were examined in the same way, and the worms collected, counted and identified. Our work covered the efficacy of our drugs against other worms, as well as strongyles, and these findings are covered in the paper immediately following this.

Railliet (1915) notes that Giles gave a pony thymol to remove *Cylicostomum*, using 3 doses of 15 grams each, which removed many worms. Subsequently he gave the same animal a lavage

with a watery emulsion of 45 grams of thymol dissolved in alcohol. This killed the worms and the horse. Railliet also notes that Theobald gave a horse thymol, 1 gram in the morning and 1 gram in the evening, the dose being dissolved in 30 grams of alcohol. The next day he gave castor oil. Theobald claims that this killed strongyles, ascarids and pinworms, and even killed the encysted forms. Railliet further notes that Dorn and Bochberg used atoxyl, the former injecting 3 grams in 100 grams of water at 37°C., and the latter injecting 0.2 to 1.5 grams in 1 percent saline solution intravenously and subcutaneously. Leneveu (1915) recommends the use of carbon bisulphide in gelatine capsules, giving 2 to 5 grams, according to the size of the animal, every day for 5 days, and following this on the sixth day with a purgative, preferably magnesium sulphate. Conreur (1915) gives 1- to 2-year-old colts a hard soap bolus containing 6 gms. of thymol, a half a gram of santonin, and 6 gms. of aloes. One bolus is given every 2 to 4 days for a total of 3 or 4 doses. The dose is doubled for a 3-year-old.

In our experiments, some of the common anthelmintics which are given to horses for worms, usually for ascarids, were tested. These anthelmintics were iron sulphate, tartar emetic, and turpentine. In addition we tested oil of chenopodium, which has been recommended for worms in horses by Thum (1915) and by Woolridge (1916). Thum gives suckling foals 3 doses at 2-hour intervals for a total of 50 drops, followed 2 hours later by castor oil if desired, and gives 50 to 100 drops to colts which are weaned. He thinks it is much safer than tartar emetic. Woolridge gave a horse 1 dram of oil of cheopodium and 40 grains of thymol twice a day for a month and reports that the animal passed myriads of worms and became fat. The dosage used and recommended for the other drugs named varies considerably. Iron sulphate is given in doses of 1 ounce to the fasting animal, in 2- to 4-dram doses in a mash, twice a day for 7 days. Tartar emetic is given in doses of one ounce in aloes ball to the fasting animal, 2 to 4 drams in a mash twice a day for 5 days, etc. Turpentine is usually given in doses of 1 to 4 ounces in a half pint to a quart of linseed oil. Place (1915) says of turpentine: "One or two teaspoons of chloroform increases the effectiveness of the mixture and the risk."

Our experiments were as follows:

Horse No. 1640, a 14-year-old gelding weighing 1075 pounds, was given 2 drams of iron sulphate in a mash daily for 7 days.

The third day of treatment the horse passed 2 *Cylicostomum*, the fourth day 1, and the sixth day 1, a total of 4 *Cylicostomum*. The horse was killed 10 days after the last treatment, the manure being examined during this period following treatment. On postmortem examination the animal had 288 *Cylicostomum* and 80 *Strongylus*. The treatment was 0 percent effective against *Strongylus* and much less than 1 percent effective against *Cylicostomum*; in other words, a failure.

Horse No. 32, an 11-year-old gelding weighing 1250 pounds, was given 2 drams of tartar emetic in a mash daily for 5 days. The third day the horse passed 1 *Cylicostomum*, the fourth day 1, the first day after the last treatment 2, the third day 4 *Cylicostomum* and 1 *Strongylus*, the seventh day 1 *Cylicostomum*, and the twelfth day 1, a total of 10 *Cylicostomum* and 1 *Strongylus*. On postmortem the horse had 5474 *Cylicostomum* and 312 *Strongylus*. The treatment was therefore less than 1 percent effective against *Cylicostomum* and *Strongylus*; in other words, a failure. The small intestine showed numerous petechiae and ecchymoses which were apparently due to the action of the drug.

Horse No. 371, a 9-year-old gelding weighing 1050 pounds, was given 2 ounces of turpentine, followed immediately by a quart of linseed oil. The next day the horse passed 9 *Strongylus* and 56 *Cylicostomum*, the second day 50 *Strongylus* and 211 *Cylicostomum*, the third day 18 *Strongylus* and 3 *Cylicostomum*, the fourth day 3 *Strongylus*, the fifth day 22 *Strongylus*, the sixth day 3 *Cylicostomum*, a total of 102 *Strongylus* and 274 *Cylicostomum*. The seventh day the animal passed no worms and was killed. On postmortem examination the horse had 105 *Strongylus* in the cecum and 7 in the colon, a total of 112; no *Cylicostomum* was found. The treatment was therefore 100 percent effective against *Cylicostomum* and 48 percent effective against *Strongylus*, a very good showing. This horse had been fasted less than 24 hours, and it is possible that greater efficacy would have resulted from a longer period of fasting.

Horse No. 1641, a 13-year-old mare weighing 1100 pounds, was given 8 mils of oil of chenopodium, followed immediately by a quart of linseed oil. The third day after treatment the horse passed 1 *Cylicostomum*, the fourth day 1 *Cylicostomum*, and the sixth day 1 *Strongylus* and 430 *Cylicostomum*. The treatment was therefore less than 1 percent effective against strongyles; in other words, a failure. This horse had been fasted less than 24 hours.

Horse No. 89, an 11-year-old gelding weighing 1070 pounds, was given 10 mils of chenopodium, a somewhat larger dose than in the previous case, followed immediately by a quart of linsseed oil. The second day the horse passed 5 *Strongylus* and 169 *Cylicostomum*, and the third day 2 *Cylicostomum*. The horse was killed the third day. On postmortem examination, 16 *Cylicostomum* were found dead and being passed out in the floating colon, making a total of 187 *Cylicostomum* to be credited to the anthelmintic. There were still left 1545 *Strongylus* and 448 *Cylicostomum*. The treatment was therefore less than 1 percent effective against *Strongylus* and was 29 percent effective against *Cylicostomum*. The horse had been fasted less than 24 hours and was inadvertently fed shortly before treatment.

Horse No. 272, an 11-year-old gelding weighing 1150 pounds, was given 16 mils of chenopodium, double the dose given to No. 1641, followed immediately by a quart of linseed oil. The next day the horse passed 4 *Strongylus* and 17 *Cylicostomum*, the second day 7 *Strongylus* and 15 *Cylicostomum*, the third day 39 *Strongylus* and 70 *Cylicostomum*. The horse was killed on the fourth day and found to have 19 *Strongylus*. The treatment was therefore 100 percent effective against *Cylicostomum* and 76 percent effective against *Strongylus*. The horse was fasted less than 24 hours before treatment.

Horse No. 273, an 11-year-old gelding weighing 1100 pounds, was given 18 mils of chenopodium, followed immediately by a quart of linseed oil. The next day the horse passed 64 *Cylicostomum*, the second day 293 *Cylicostomum* and 7 *Strongylus*, and the third day 64 *Cylicostomum* and 1 *Strongylus*, a total of 421 *Cylicostomum* and 8 *Strongylus*. On postmortem examination the horse had 7 *Cylicostomum* and 1 *Strongylus* in the floating colon, which should be credited to the efficacy of the anthelmintic. There were also 102 *Strongylus* and 3195 *Cylicostomum*. The treatment was therefore 11 percent effective against *Cylicostomum* and less than 1 percent effective against *Strongylus*. The horse was fasted less than 24 hours before treatment.

Horse No. 1033, a 6-year-old gelding weighing 1075 pounds, was given 16 mils of chenopodium, followed immediately by a quart of linseed oil, the horse having been fasted a full 24 hours before treatment. The next day the animal passed 1 *Cylicostomum*, the third day 30 *Cylicostomum* and 30 *Strongylus*, the fourth day 34 *Cylicostomum* and 49 *Strongylus*, and the fifth day 12 *Cylicostomum* and 8 *Strongylus*, a total of 77 *Cylicos-*

tomum and 107 *Strongylus*. The animal was killed on the fifth day. On postmortem examination there were found 2 larval *Cylicostomum* that might have issued from a cyst in the esophageal mucosa after the treatment, and probably did do this. Regarding them as having issued from their cysts after the passage of the anthelmintic, the treatment was 100 percent effective against *Cylicostomum* and *Strongylus*. Even regarding them as surviving the anthelmintic would make the treatment 97 percent effective against *Cylicostomum*.

Horse No. 240, an 8-year-old gelding weighing 1100 pounds, was given 16 mils of oil of chenopodium followed 2 hours later by a quart of linseed oil. The next day the horse passed 352 *Cylicostomum* and 1 *Strongylus*, the second day 184 *Cylicostomum* and 26 *Strongylus*, the third day 4 *Cylicostomum* and 22 *Strongylus*, the fourth day 6 *Strongylus*, and the fifth day 2 *Strongylus*, a total of 540 *Cylicostomum* and 61 *Strongylus*. The horse was killed on the fifth day. On postmortem examination, 2 dead *Strongylus* were found in the floating colon and 3 dead *Strongylus* in the double colon, which worms must be regarded as killed by the anthelmintic. There were also 3 live *Strongylus* in the cecum. The treatment was therefore 100 percent effective against *Cylicostomum* and 96 percent effective against *Strongylus*.

Horse No. 1031, an 8-year-old gelding weighing 1060 pounds, was given the iron sulphate treatment. The intention was to give doses of 4 grams of iron sulphate twice daily in a mash, for a period of 7 days, but as the horse refused to clean up this amount of medicated mash, the 14 doses were administered over a period of 12 days. The manure was only casually examined for *Strongylus* and *Cylicostomum*, being primarily examined for ascarids. The third day of the treatment the horse passed 1 *Cylicostomum*, the fifth day 2 *Cylicostomum*, a total of 3 *Cylicostomum*. Sixteen days after beginning treatment, the horse was given 3 doses of 6 mils of chenopodium at hour intervals, the last dose being followed an hour later by a quart of linseed oil. The horse was fasted over 24 hours. The day of treatment the horse passed 49 *Cylicostomum*, the following day 1024 *Cylicostomum* and 54 *Strongylus*, the second day 103 *Cylicostomum* and 11 *Strongylus*, the third day 30 *Cylicostomum*, the fourth day 35 *Cylicostomum* and 6 *Strongylus*, and the fifth day 1 *Cylicostomum* and 5 *Strongylus*, a total of 1242 *Cylicostomum* and 76 *Strongylus*. The horse was killed on this fifth day and found to have 2 larval *Cylicostomum*, which we regard as having left their

cysts in the intestinal mucosa after the anthelmintic had passed out, and 4 live *Strongylus* in addition to the 2 dead *Strongylus* passing out in the floating colon. The treatment was therefore 100 percent effective against *Cylicostomum* and 95 percent effective against *Strongylus*.

From the foregoing experiments we may come to the following conclusions:

Iron sulphate in the light dose used (2 drams in a mash daily for 7 days) was a failure, removing no *Strongylus* and less than 1 percent of the *Cylicostomum* present. Not too much may be concluded in regard to the value of larger doses, but in view of the fact that this treatment is not recommended for strongyles, it is likely that it is not of much value. This conclusion is substantiated by the poor results obtained from the administration of 7 ounces of iron sulphate over a period of 12 days in the case of Horse No. 1031.

Tartar emetic in the light dose used (2 drams in a mash daily for 5 days) was a failure, removing less than 1 percent of the strongyles present. The evidence of severe irritation in the digestive tract postmortem inclines us to believe that this drug is not apt to prove of much value in this condition, as increased size of dose to secure greater efficacy would mean a degree of gastro-intestinal irritation that in our opinion should be avoided.

Turpentine in a moderate dose (2 ounces in a quart of linseed oil) was a rather effective remedy in the one test made, removing all of the *Cylicostomum* and 48 per cent of the *Strongylus*.

Oil of chenopodium was a failure in small doses with less than a 24-hour fast, failing to remove 1 percent of the strongyles present in a dose of 8 mils; it was less than 1 percent effective against *Strongylus* and only 29 percent effective against *Cylicostomum* in a dose of 10 mils. In larger doses, with less than a 24-hour fast before treatment, the findings are somewhat contradictory: a 16-mil dose was 100 percent effective against *Cylicostomum* and 76 percent effective against *Strongylus*, while an 18-mil dose was 11 percent effective against *Cylicostomum* and less than 1 percent effective against *Strongylus*. In these same larger doses, with fasts of at least 24 hours, the treatment is highly effective. In one case, where the chenopodium and linseed oil were given simultaneously, the treatment was apparently 100 percent effective against strongyles; in another case, where the linseed oil was given 2 hours after the chenopodium, the treatment was 100 percent effective against *Cylicostomum* and 96

percent effective against strongyles; in another case, where the chenopodium was given in divided doses followed by linseed oil an hour after the last dose, the treatment was 100 percent effective against *Cylicostomum* and 95 percent effective against *Strongylus*.

#### SUMMARY.

Contrary to what has been supposed, the removal of strongyles from the large intestine of the horse presents no great difficulties. The remedy of choice is oil of chenopodium, which displays an efficacy of 95 to 100 percent when given to horses fasted 36 hours and given in doses of 16 to 18 mils, in one dose or in divided doses, accompanied by a quart or a liter of linseed oil or followed one or two hours later by this amount of linseed oil. The small worms, *Cylicostomum*, are more readily removed than the large, red palisade worms, *Strongylus*, probably due to the fact that *Strongylus* attaches to the mucosa and *Cylicostomum* does not. Turpentine appears to be the second choice of the remedies tested. In the doses used, iron sulphate and tartar emetic gave very poor results and promised little of value in the treatment of strongyliosis.

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## SOME NOTES ON THE TREATMENT OF EQUINE ASCARIASIS AND OXYURIASIS.

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In the foregoing paper the writers have shown that equine intestinal strongylidosis, contrary to what might be supposed, is a disease readily amenable to treatment so far as the removal of the adult worms from the intestine is concerned. In this paper we can confirm the idea that equine oxyuriasis is readily amenable to anthelmintic treatment, as has been stated by such authorities as Railliet, and the idea that equine ascariasis is not readily amenable to anthelmintic treatment by therapeutic doses of safe anthelmintics of which we are at present aware, as Neveu-Lemaire has noted.

In the series of 10 horses used in the anthelmintic investigations reported in our foregoing paper, 7 had infestations with *Oxyuris equi*. The anthelmintic treatments given (for which, see the paper referred to) removed 100 percent of the pinworms present from 5 of the 7 horses, as follows: Horse No. 240, 2 worms; Horse No. 1031, 1 worm; Horse No. 1033, 1 worm; Horse No. 32, 1 worm; Horse No. 371, 34 worms. Treatments failed entirely to remove worms and left worms present as follows: Horse No. 273, 2 worms; Horse No. 1640, 3 worms.

Reference to the foregoing paper shows that 18 mils of oil of chenopodium, followed immediately by a quart of linseed oil, in the case of an animal that had fasted less than 24 hours, was a failure, and that 2 drams of iron sulphate in the feed daily for 7 days was a failure. It may be noted also that the administration of 7 ounces of iron sulphate over a period of 12 days to Horse No. 1031, previous to the administration of the chenopodium, was also a failure. On the other hand, the treatments with adequate doses of oil of chenopodium, 16-18 mils, to animals fasted over 24 hours, with 2-ounce doses of turpentine, and with daily administration of 2 drams of tartar emetic in the feed for 5 days, were entirely successful.

Of the same 10 horses, 8 had ascarids, *Ascaris equorum*. The anthelmintic treatments given were entire failures in the case of 4 of the 8 horses and left worms present as follows: Horse No. 89, 30 worms; Horse No. 371, 15 worms; Horse No. 272, 1 worm; Horse No. 1641, 4 worms. The treatment removed 3 percent of the worms from Horse No. 1033, removing 7 and leaving 214; 8 percent from Horse No. 32, removing 1 and leaving 11; 12 percent from Horse No. 273, removing 2 and leaving 14; and 25 percent from Horse No. 1031, removing 1 and leaving 3.

The foregoing results are not of themselves especially encouraging, but they constitute a guide for further work and considering the lack of dependable experimental work in this field they cannot be regarded as discouraging. Equally unsatisfactory results in initial experiments are very commonly followed by entirely satisfactory results, and it is worth while to know what methods will not prove profitable. Modifications in the size of dose or mode of administration of some of the drugs noted may give much higher values for the drugs used. At present we can only state that additional experimental work is necessary before we can feel that we have a dependable anthelmintic for the removal of ascarids from horses.

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**CIVIL SERVICE COMMISSION ASKS FOR TYPE-WRITERS AND STENOGRAPHERS TO  
HELP WIN THE WAR.**

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The United States Civil Service Commission requests our assistance in the campaign to recruit a sufficient number of stenographers and typists, both women and men, to meet the great demand of the Government offices in Washington, D. C. Those who have not the required training are encouraged to undergo instruction at once. Tests are given in 550 cities every Tuesday. Full information and application blanks may be obtained from the Secretary of the Local Board of Civil Service Examiners at the postoffice or custom-house in any important city. This is a "win-the-war" measure.

## **CLINICAL AND CASE REPORTS.**

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"Knowledge is born in laboratories and in the experience of the thoughtful. It develops form in the journals, and 'when dead it is decently buried in books'."

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### **MYCOTIC CEREBRO-SPINAL MENINGITIS PREVALENT IN THE SOUTH.**

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Due to peculiar climatic conditions, which are responsible at this time for the toxicity of mould, or fungus, on vegetation throughout pastures, there are in some five or six southwestern parishes of the state extensive outbreaks of Mycotic Cerebro Spinal Meningitis, affecting mules and horses.

Investigations from this office and reports from deputy veterinarians indicate that the condition is diffuse over wide areas and that the mortality is high. Preventive measures, consisting mainly in the removal of all animals to dry lots or barns, and feeding of well-cured grain, in addition to pure, uncontaminated water, is curtailing outbreaks where such advice is being adopted.

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### **A PECULIAR DISEASE OF SHEEP.**

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Dr. R. R. Dykstra, Manhattan, Kansas, reports the prevalence, in the State of Kansas during the summer, of a peculiar disease of sheep, which, so far as he has been able to observe, corresponds in every respect to a condition described as "Big Head in Sheep" in a circular issued by the United States Department of Agriculture, May 4, 1914, a bulletin on the subject having been written by Dr. H. J. Frederick of the Utah Experiment Station.

The Veterinary Department of the Kansas State Agricultural College has conducted some minor investigations, but up to recently nothing new has been discovered outside of the information in the Bureau of Animal Industry circular. The disease has become so prevalent in Kansas that, at the instigation of Dr. Dykstra, the College Publicity Department has sent out informa-

tion regarding it similar to that contained in the following short article:

#### BIG HEAD IN SHEEP.

This is a peculiar ailment affecting lambs in particular, though older sheep are occasionally affected. The first noticeable symptoms of the disease are that the animal throws its head up in a peculiar jerking manner and tries to rub or scratch it. The animal sometimes runs into other sheep and objects in its path on account of the fact that the eyesight is affected. In a very short time the ears become of a reddish color and greatly enlarged. At the same time the face becomes swollen and little drops of serum of a light yellow color make their appearance on the swollen parts. The animal is always feverish. The foregoing symptoms may develop into severe forms of the disease in from thirty minutes' to one hour's time. In very severe cases the tongue may become swollen so that the mouth is completely filled. This causes difficult breathing so that the animal will struggle, become exhausted, and soon die. The symptoms are not so intense in all cases, so that there are occasionally spontaneous recoveries.

This disease has been observed by sheep men for upwards of thirty years in Utah and the surrounding states, causing great loss in those sections. It is spoken of by sheep men as "Big Head." It has not been previously observed in the plains states.

The cause of the condition is not known, though it seems that climatic conditions have something to do with its appearance. It is quite readily treated if affected sheep are held immediately after they show the first symptoms. *Absolute rest* and protection from the direct sun light is followed by recovery in from eight to twenty hours, the animals appearing as well as ever. In addition, it is a good plan if the swollen parts of the head are anointed with vaseline or olive oil.

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#### HOGS AND THE TENT CATERPILLAR.

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The following interesting report is from Dr. F. M. Hayes, University Farm, Davis, California:

In June, 1918, the writer was called to investigate a disease in hogs suspected by the owners to be hog cholera. The true cause and effects were found to be so unusual that they may be worthy of publication and of interest to the readers of the Journal.

The condition was reported on two ranches in a small valley of 25 square miles. The foot hills were thickly covered with oak trees and dry grass. The hogs ranged from the edge of the valley floor to a considerable distance up the hills. On those ranches reporting trouble about thirty hogs had died within two weeks, while the remainder of the two herds of forty-seven and thirty-five, respectively, were showing some symptoms of disorder. The condition had been variously diagnosed by the residents as "poisoning from dead ground squirrels," "change of feed from range to barley," "fungi growing in the stomach," "hog cholera," etc.

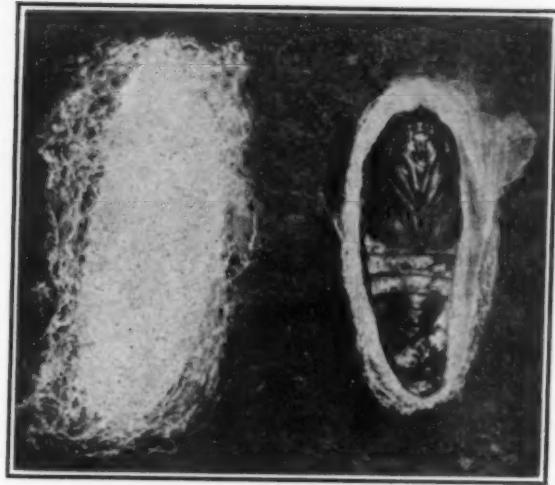
The most prominent symptom noted was the defecation of long strings of feces. This was accompanied by severe straining, which resulted, in many cases, in leaving a trail of several inches of feces still attached to the hog. All of the hogs looked gaunt, but most of them were on feed. The owners had a short time before corralled the hogs and were feeding soaked barley. Fever was not a constant symptom, but was found in hog later upon autopsy.

A pig showing symptoms of abdominal distress and apparently moribund was selected for an autopsy. A well-defined volvulus of the small intestine was at once noted. A considerable length of this bowel was swollen, the walls and lumen containing a quantity of extravasated blood. The peritoneal cavity contained an excess of fluid. Other lesions were not important. Upon opening the digestive tract from the stomach to the anus an undigested mass was removed in one continuous string intact. A dissection of this material showed it to be largely composed of a fine, wool-like fiber enmeshing bits of grass, barley hulls and small fragments of a dark brown material. The wool-like fibers on being separated appeared finer than wool, and suggested some woolly plant or silk.

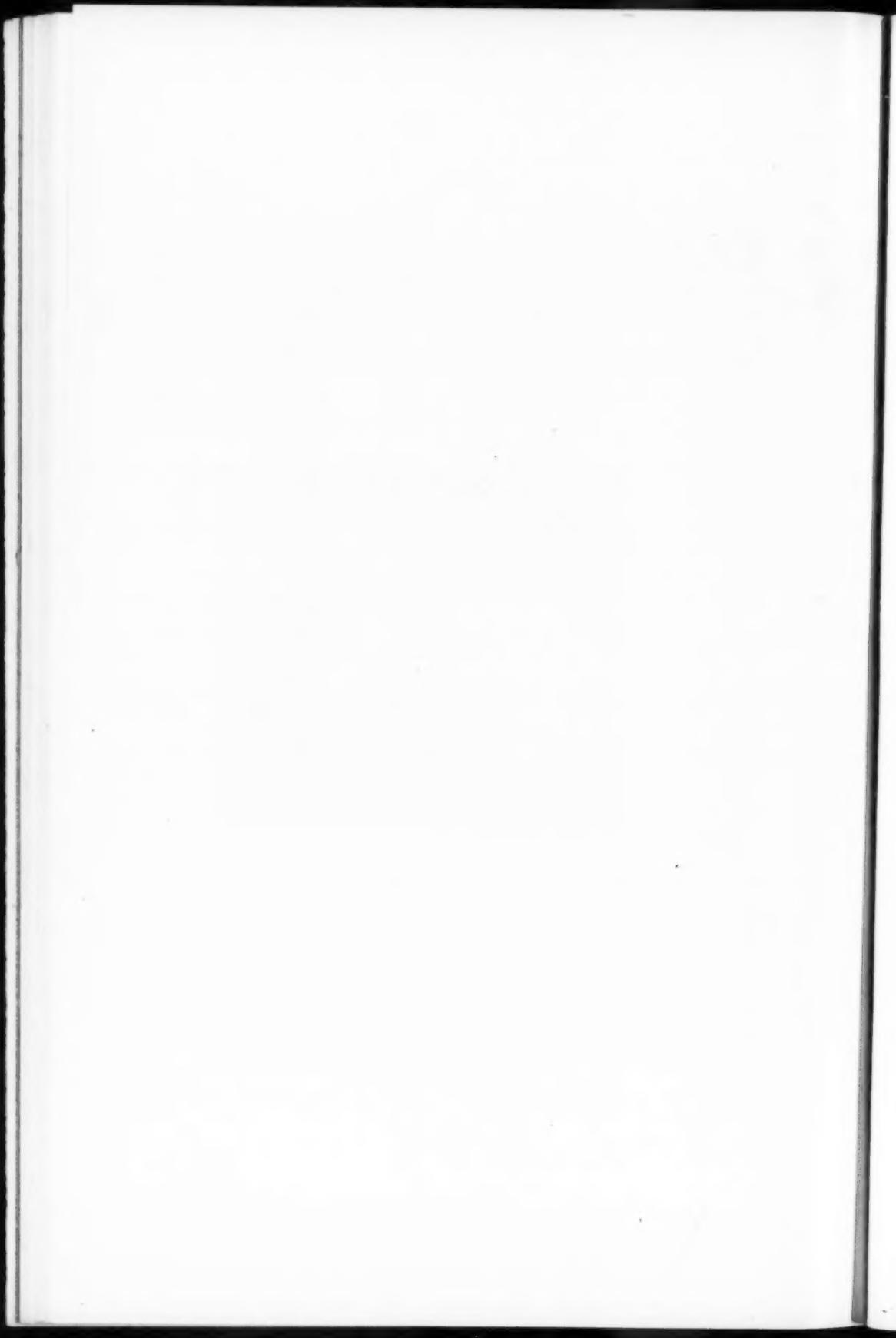
The owners had held autopsies on a few of the dead hogs and from their description it seems probable that the exciting causes of death in most instances were invaginations and twists of the bowel. We should expect such pathological changes from the nature of the cause.

It was evident by this time that the etiological factor must be sought in the feeding conditions. An examination of the range was begun. The first object of a suspicious nature observed was a cocoon of the tent caterpillar attached to a plant near the ground. The individual fibers of the cocoon were identical, as far as the eye could observe, with the individual fibers of the

*Photo from Bureau of Entomology,  
U. S. Dept. of Agr.*



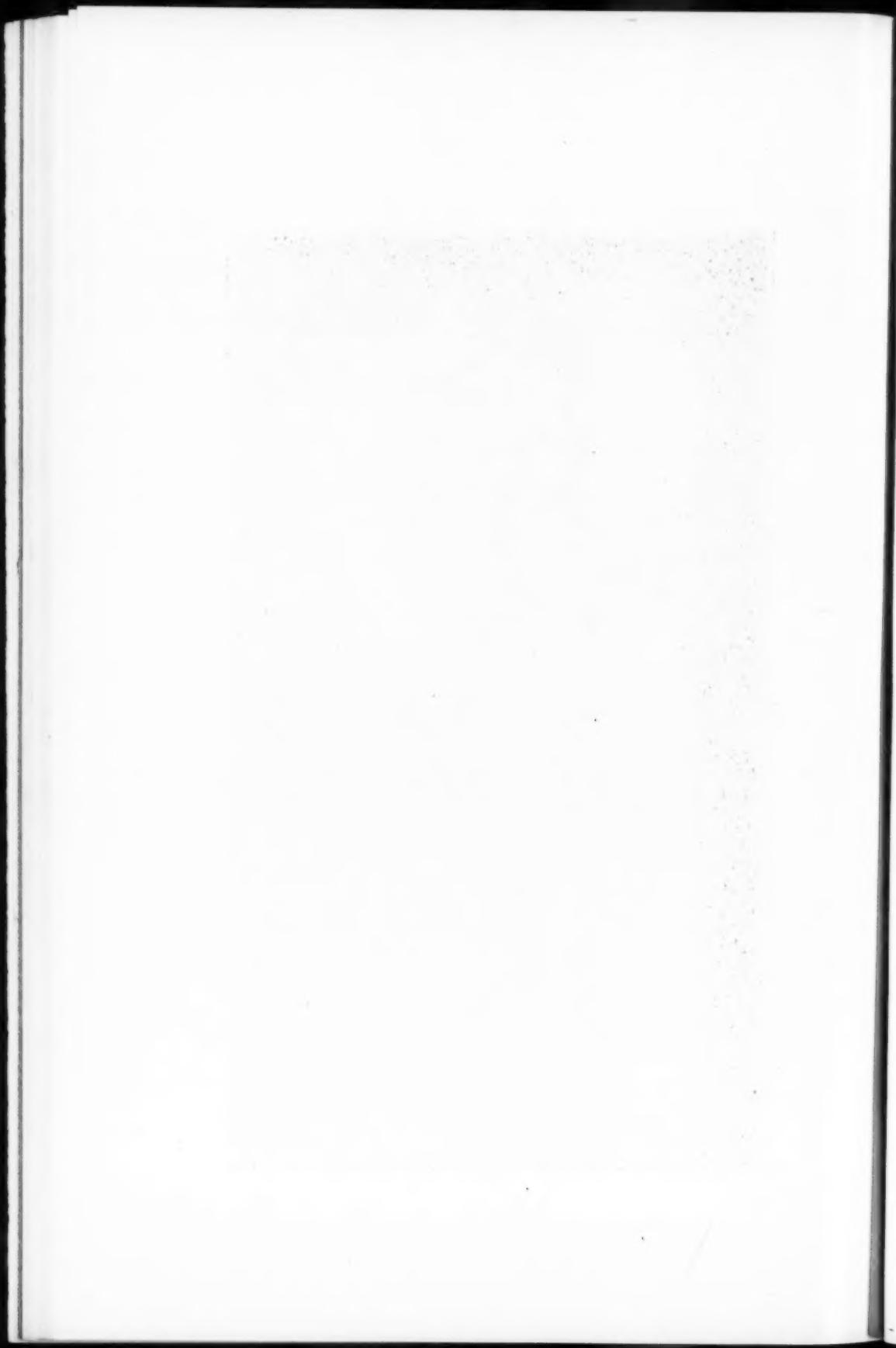
Tent Caterpillar and Uncovered Pupa.

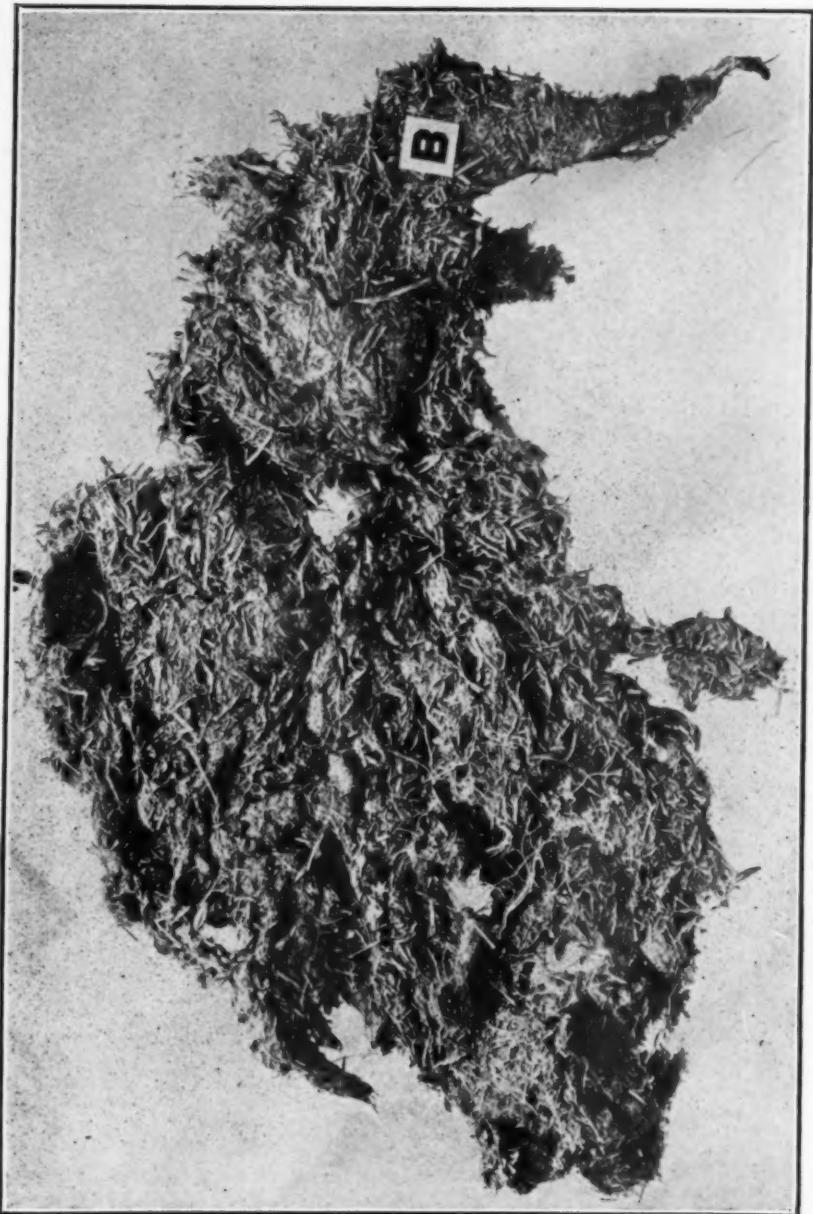




F. M. HAYES

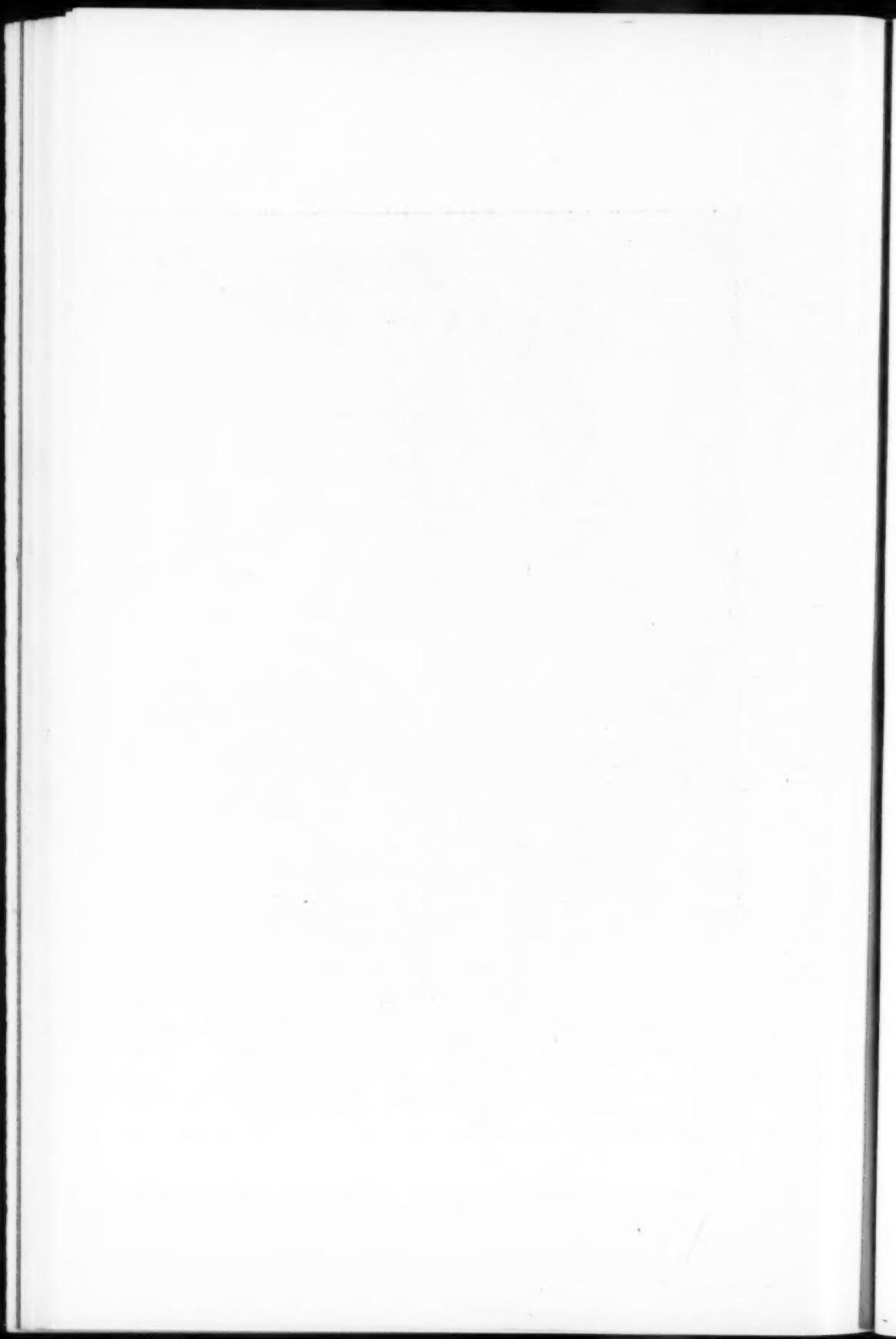
Tent Caterpillar Cocoons Attached to Oak Leaves.

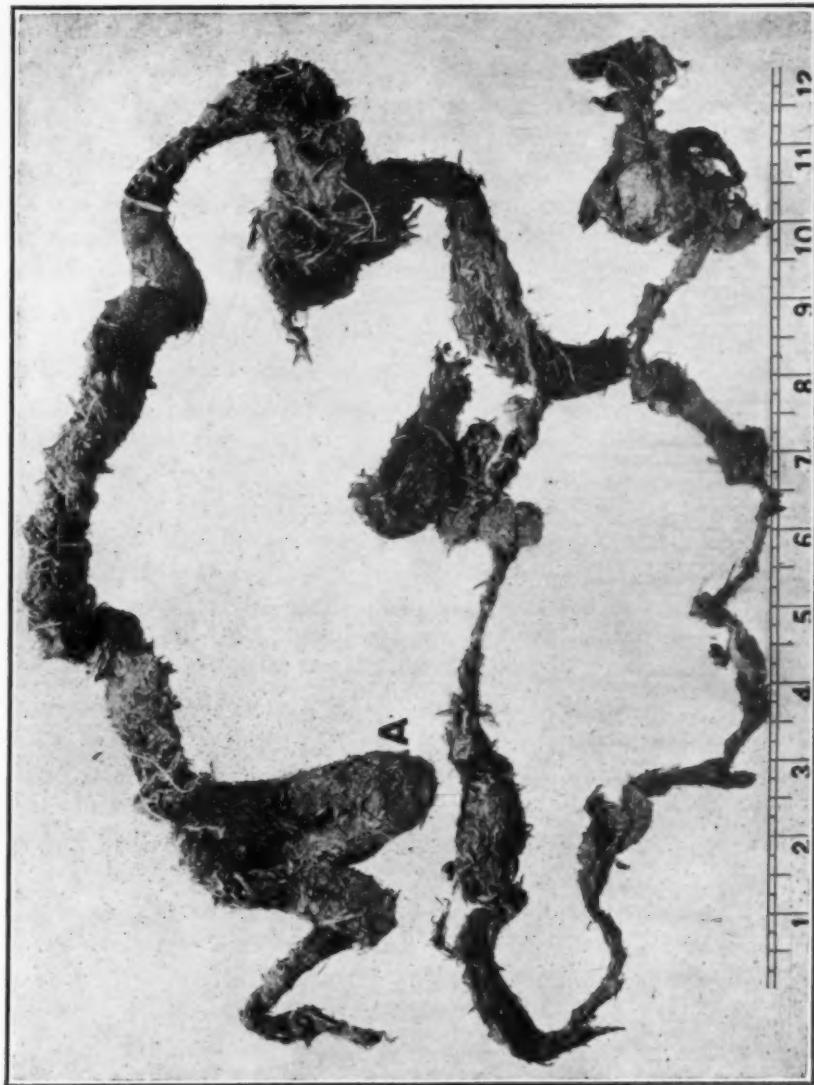




F. M. HAYES

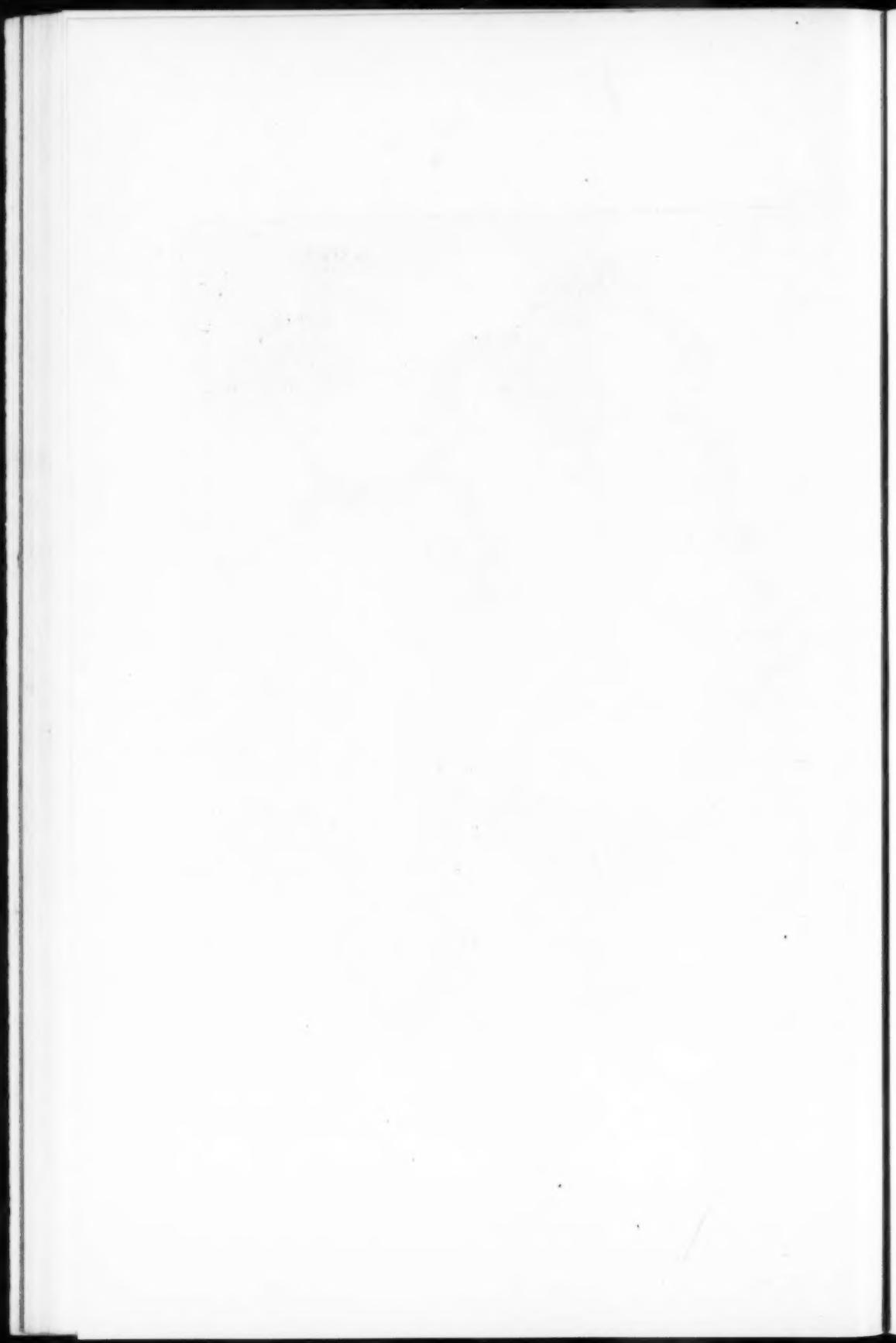
Indigestible mass of cocoon silk and pupæ, grass and barley taken  
from a pig's stomach. B. End extending through the pylorus.





F. M. HAYES

Over three feet of adherent intestinal contents. The cocoon silk fibres matted so that the contents of the stomach, small and large intestines made one long, continuous rope. Note (A) ileocecal valve contour.



intestinal mass. A further search disclosed hundreds of these cocoons on plants along ravines and on the leaves of the oak trees. Some of the oaks were practically denuded of leaves by the tent caterpillars, many of which were still to be seen. This evidence resulted in the owner of the hogs stating that the caterpillars had not been so numerous in his ten years of residence there.

To complete the evidence against the tent caterpillar cocoon, a number were collected. A few were thrown in front of a healthy looking shoat. They were consumed with avidity. The experiment was repeated on others, with the same result. A closer inspection of the stomach contents of the hog upon which the autopsy was held proved the dark brown fragments mentioned above to be masticated pupae. We now felt justified in concluding that the cocoon of the tent caterpillar was the causative factor in this trouble.

No treatment was advised other than to keep the hogs away from the infested range until the pupae had emerged. The majority recovered under this treatment. The older hogs either had not acquired a liking for the juicy pupae or were better able to take care of the indigestible silk fiber of the cocoon.

Professor E. R. DeOng of the Entomology Division of the University of California has submitted the following interesting facts concerning the life history and the periodic outbreak of the tent caterpillar in relation to range feeding of hogs:

"California forests are subject to periodic outbreaks of the forest tent caterpillar (*Malacosoma disstria*), oaks being especially liable to their attack. During these outbreaks thousands of acres of forests are practically defoliated, the trees and shrubbery swarming with caterpillars, which have hatched from little bands of eggs attached to the twigs throughout the winter; and then as suddenly as they appeared the army is gone. To the careless observer the worms are dead but a closer examination shows their hairy cocoons, scattered over the forest floor, on logs, brush and tree trunks. In these cocoons are developing moths. The greater part of these have been parasitized and instead of the rightful descendant there appear swarms of hairy flies and parasitic wasps. Next year the order is reversed, an excess of parasites starves to death from lack of host insects, for the caterpillars are very rare this summer, but will be increasing year by year, as will also their insect enemies. In the course of five or six years another outbreak of caterpillars will probably occur and furnish an abundance of cocoons for which the hogs may again acquire a taste."

## ABSTRACTS FROM RECENT LITERATURE.

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### TYMPANITES IN DOG.

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Brown curly-coated retriever.—Vomiting, and abdomen measuring 24 inches in circumference just in front of penis. Palpitation drumlike, and no waves on percussion; in feel like a football blown up. I inserted horse trocar and canula high up and downwards and forwards in right flank. Air rushed out for three minutes. Great relief of dog and cessation of vomiting. Abdomen now measures 20 inches in circumference.

Gave aredicium liq. am. fort. 5 minims, taraxacum 1 fl. drachm, tr. nux. vom. 10 minims, and repeated next day. Could detect no foreign body in stomach or bowels. Dog made an excellent recovery.

Find no record in canine text-books of hoven in the dog; probably due to war rations.—G. Mayall, M. R. C. V. S., Bolton, in *Veterinary Journal*.

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### MANGE IN HORSES.

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Sir Stewart Stockman, Chief Veterinary Officer of the Board of Agriculture, recently gave an address to London carmen on "Parasitic Mange in Horses" at the Elephant and Castle Horse Repository. It was mentioned by Mr. A. L. Leon, Chairman of the Public Control Committee, London County Council, that 500 horses suffering from mange were now under detention in London, and there were about 5,000 cases in Great Britain.

Sir Stewart Stockman attributed the increase of mange to short rations, shortage of labor, and the fear of owners to report cases. But the Board had issued an order enabling owners to use their horses for work under certain conditions that prevented contagion. He explained the characteristics of the two forms of mange, the more serious form presenting some difficulty through the burrowing of the parasite into the animal's skin, and described the treatment by a lime and sulphur mixture which he

recommended, advising that it should, as an additional safeguard, be used in combination with tar-oil and tar dips. The cost of bathing a horse was two or three pence (4 or 6 cents).—*Morning Post* (London).

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### STANDARDIZED TUBERCULIN.

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A veterinary correspondent writes to the Glasgow Herald:

It must be obvious to all parties engaged in the cattle trade of this country, and more especially to breeders and exporters of pedigree stock, that unless a recognized and standardized tuberculin is at once placed on the market by the various tuberculin manufacturers, our export trade in pedigree cattle will suffer. There are too many makes of tuberculin on the market at present. The tuberculin is of varying strengths, therefore it is often unsatisfactory in results. German and Austrian tuberculin is likely to be kept out as at present. So it remains for the Allied countries to decide as to what standard tuberculin should be used to test cattle.

If a conference of cattle breeders and exporters were at once called at some agreed upon center, this matter could be discussed in a friendly way. I am satisfied that most important matters could be satisfactorily arranged. When this part of the question is properly dealt with the actual work of testing the cattle would be seen to. The testing should be carried out by qualified veterinary surgeons. Any irregularities in the actual testing could then be more easily discovered and summarily dealt with. The offenders could be punished and prevented from having any hand whatever in the future testing of cattle with tuberculin.—*Veterinary News*.

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### NECROSIS AND OSSIFICATION OF THE CARTILAGES OF THE LARYNX OF THE HORSE.

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(Nécrose et ossification des cartilages du larynx chez le cheval.)  
CHARMOY, Rec. Méd. Vét. Vol. XCIV., No. 7. April 15, 1918.

In this paper Charmoy describes the lesions found by him in the larynx of four cases in which symptoms of laryngeal paralysis were very severe. Although it was not possible to learn any

particulars of the history of the cases, there was evidence that in three of them the Williams operation had been performed, while in the fourth some laryngeal operation of an unknown nature had been attempted. In all four animals there were fistulæ, which in three opened into the cavity of the larynx; in the other case the opening was on the surface of the body. Postmortem examination revealed necrotic areas either in the thyroid, cricoid, or arytenoid cartilage, or in more than one of these, surrounded by ossification of the cartilage.

The author points out that diagnosis of ossification is possible on palpation, when rigidity of the cartilages, and often some hypertrophy of the walls of the larynx, may be recognized. Naturally, diagnosis can be confirmed with certainty only by an exploratory laryngotomy.

In discussing the etiology of the necrosis and the consequent ossification, the author concludes that the lesions in his cases could only have had a traumatic origin; and, seeing that contusions and accidental wounds of the larynx are somewhat rare, he is of the opinion that the traumatism was inflicted during the operation intended to relieve the symptoms of laryngeal paralysis. He therefore insists on the importance of the avoidance of injury during laryngeal operations.—*Veterinary Review*.

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## ARMY VETERINARY SERVICE.

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### MAJOR'S RANK NOT FOR VETERINARIANS.

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The following is taken from among the Comptroller's decisions published in The Army and Navy Journal of September 7:

"The appointment or promotion of a veterinarian to the rank, with pay and allowances, of a major is not authorized by existing law."

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### APPOINTMENTS AND REDUCTION OF ENLISTED VETERINARIANS.

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General Orders, No. 58:

IV. 1. The following methods of appointments and reduction of the enlisted personnel of the Veterinary Corps will govern during the existing emergency:

(a) In divisions, the division veterinarian may promote enlisted men of the Veterinary Corps up to the authorized allowance and may sign warrants "for the Surgeon General."

(b) In veterinary, base veterinary, corps veterinary, and the Army mobile veterinary hospitals the enlisted personnel of the Veterinary Corps will be promoted by the veterinarian in charge, who may sign warrants "for the Surgeon General," except that while any of these units are in a training school any appointment must be approved by the senior veterinary instructor.

(c) In veterinary detachments assigned to auxiliary remount depots, or to remount squadrons, or to any other detached command the sergeants first class, sergeants and corporals will be issued warrants by the Surgeon General upon recommendation of the veterinarian. Farriers, horseshoers, cooks, privates first class and saddlers will be appointed by the veterinarian.

2. Any veterinarian may make reductions when in his judgment the same may be necessary, provided that the officer ordering the reduction shall have the power to fill the vacancy thus created.—*Official Bulletin*, August 15.

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#### COMPLIMENTARY TO LIEUTENANT-COLONEL AND MAJOR MERILLAT.

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The Chicago Sunday Tribune of recent date contained the following complimentary notice, with pictures, of Lieutenant-Colonel L. A. Merillat and his son, Major L. A. Merrillat, Jr., who are both in France with the American Expeditionary Force:

Wooster, O., Aug. 31.—A Chicago father and son have won promotions in the United States army in France.

Word which has reached Mrs. L. A. Merillat, at the Merillat country home near here, states that her husband has been promoted from major to colonel, and that her son, L. A. Merillat, Jr., has been promoted from captain to major.

Colonel Merillat was formerly junior member of the firm of Wright & Merillat, veterinary surgeons, 1827 Wabash avenue, Chicago. He was commissioned a major in the veterinary department of the army early in the summer, and assigned to immediate overseas service. After reaching France he was made the American representative on a Franco-American commission governing the veterinary interests of the two armies. Later he was named

chairman of this commission. Colonel Merillat formerly served both as President and Secretary of the American Veterinary Medical Association.

The son, Major Merillat, is a West Point graduate, and has the honor of being commissioned a major at the age of twenty-six years, which makes him one of the youngest majors in the national army. While at West Point Merillat won fame as a football player, being selected during two successive years as an all-American end. He is serving with the second division of the regular army.

Colonel and Major Merillat recently enjoyed their first meeting on French soil.

Mrs. Merillat is residing at their country home here while her husband and son are serving in France. She is managing their 130-acre farm.

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#### **AN INTERESTING LITTLE MEETING OF OFFICERS AT THE SADDLE AND SIRLOIN CLUB.**

About forty veterinary officers engaged in meat inspection at Chicago under Major Lytle enjoyed a fine "get-together" dinner at the Saddle and Sirloin Club on the evening of September 6.

Lieutenant John Quinlan presided and told of the excellent work being done, not only in the inspection of meat and other animal food products, but also in the special training given the veterinary officers in the work.

Secretary Mayo, as guest of the evening, told of the work the A. V. M. A. was doing in securing proper recognition of the army veterinarians and in the organization of the present efficient veterinary corps. He also spoke of the debt every veterinarian owed to his profession, and the importance of every one doing his share to elevate and advance the interests of his profession.

Major Lytle deserves much credit for the efficient handling of the work and the men in his department. He has a loyal and enthusiastic group of officers, who are greatly interested in the work. A most enjoyable evening was spent at this famous club, and, as one officer expressed it, "meetings like this put a lot of 'pep' in a fellow." Every one regretted the absence of Major Lytle on account of the death of a relative.

## WHY NO MAJORS NOW IN THE VETERINARY CORPS.

The following, which we take from the Army and Navy Journal, September 14, is explanatory of the previous statement:

"The statement in our issue of September 7, quoting the Comptroller of the Treasury as deciding that the appointment or promotion of veterinarians to the rank, with pay and allowances, of a major is not authorized by existing law, brings forth inquiries as to how this may conflict with Par. 1907 of the Quartermaster Manual, based on Sec. 16 of the National Defense Act. The Comptroller makes it plain that the law referred to made it possible for veterinarians in the service on June 3, 1916, to advance to the rank of captain after fifteen years' service; and equally plain that assistant veterinarians, a new grade created by the Act of June 3, 1916, could after twenty years' service be advanced to the grade of major. But as there were no appointments of assistant veterinarians until after the passage of the National Defense Act two years ago last June, it is obvious that there could now be no candidates for promotion to major under the terms of the act, and the Comptroller approves the Auditor's decision that there is now no authority for the appointment or promotion of a veterinarian to the rank, with pay and allowances, of a major."

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Major Geo. A. Hanvey, Jr., formerly at Camp Taylor, Ky., is now Division Veterinarian with the 84th Division, American Expeditionary Forces.

Major Gould, Division Veterinarian, 88th Division, visited Camp Upton on his way back overseas and gave the veterinary officers a very interesting talk on their duties to the service.

Major R. J. Foster, who has been stationed at Fort Riley, Kas., as instructor in the Medical Officers' Training Camp, is now with the Veterinary Division, Surgeon General's office, Washington, D. C.

Dr. Wm. D. Odou of Hettinger, N. D., is now a lieutenant in the Veterinary Reserve Corps and is at the Veterinary Training School, Camp Lee, Va.

Dr. J. P. Gardner of Kingston, O., is now in the service as lieutenant and is stationed at Camp Greenleaf, Ga.

Lieutenant H. E. Van Der Veen, who has been stationed at Camp Sherman, O., is now with the 317th Engineers, American Expeditionary Forces.

First Lieutenant J. F. Derivan, V. C., U. S. A. Division Meat Inspector, 88th Division, has been promoted to captain.

Second Lieutenant O. H. Crossland, V. C., U. S. A., 88th Division, has been promoted to first lieutenant.

Second Lieutenant J. R. Barnes has reported at Camp Upton, N. Y., as camp meat inspector.

Dr. Henry T. Juen, formerly of El Paso, Tex., is now Lieutenant Juen of Co. 31, Bn. 7, Camp Greenleaf, Ga.

Lieutenant E. B. Parker has been transferred from the 313th Cavalry, Bel Rio, Tex., to the 45th F. A., Camp Stanley, Tex.

Captain Hadleigh Marsh, who has been at Fort McIntosh, Laredo, Tex., is now located at the Department Laboratory, Fort Sam Houston, Tex.

Dr. Robert Graham of Lexington, Ky., is now with the U. S. Army, Atlanta, Ga.

Lieutenant Ivan G. Howe, who has been at Camp Greene, N. C., is now Brigade Veterinarian of the 9th Brigade, 5th Division, with the American Expeditionary Forces, France. He reports that Major Blattenberg was Division Veterinarian of this Division, but that he has been ordered to the rear to take charge of a base hospital.

Dr. H. N. Waite, formerly of Corsica, S. D., is now in the service and is stationed with Veterinary Co. No. 1, Camp Greenleaf, Ga.

Captain L. E. Willyoung of Chicago, Ill., is now at 86 Mariner St., Buffalo, N. Y.

Lieutenant F. J. Reamsnyder has been transferred from Chicago, Ill., to Camp Las Banos, San Juan, Porto Rico.

Lieutenant D. M. Purdy, who has been at the Medical Officers' Training Camp, Camp Greenleaf, Ga., is now stationed at Camp Lee, Va.

First Lieutenant A. H. Harmening of Chicago has been promoted to a Captaincy.

## **ASSOCIATION NEWS.**

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### **AMERICAN VETERINARY MEDICAL ASSOCIATION.**

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#### **RESPONSE TO THE ADDRESS OF WELCOME.**

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VERANUS A. MOORE, Ithaca, New York.

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It is my very pleasant duty, on behalf of the members of the American Veterinary Medical Association, to extend to you, Honorable Sir, and through you to the officials and citizens of Philadelphia, the sincere thanks of this Association for your very cordial, whole-hearted and very gracious welcome. In the warmth of your remarks, you have explained, unconsciously, I know, at least some of the reasons why Philadelphia is known as "The City of Brotherly Love." I wish to say, in reply to your words of felicitation, encouragement and Godspeed to the members of the veterinary profession, that we, who are here assembled, are most grateful. When later, your remarks are read by our absent members, they, too, will be happy to know of your high appreciation of their work.

This Association is very glad for the invitation to meet in your wonderful city. No one can fail to appreciate the opportunity, under such pleasing auspices, to visit the many shrines here consecrated to historic, religious, educational and civic service. The bards of philosophy, art and music also have sung of your glory. Every city has its traditions but no other has the cherished memory of the life and work of a Penn and of a Franklin; no other city in America has in its treaty with the aborigines a clause of perpetuity of title that shall hold "as long as trees shall grow and waters hold their course"; no other city in the world has an Independence Hall wherein was born the liberty America enjoys and for which the world is fighting today. Your industries, the munificence of your institutions of learning, your magnificently equipped and manned veterinary college, fathered by your great university, your splendid and spacious hospitals for the unfortunate and your beautiful parks for recreation and pleasure attract the civilized world. We are familiar, Sir, with the product

of these various centers of thought and activity and now we hope to receive the baptism of inspiration that comes from close association with such noble and holy things.

Notwithstanding your generous hospitality, the magnificence of your city and the richness of your art, there is another reason for our meeting. This great association has developed, with the progress of knowledge of the biology of disease and man's power over it, from a few devoted teachers and practitioners in 1863 to an organization nearly 3000 strong. Its duties and obligations have increased equally with its membership. During this time, we have passed through the most prodigious period of change the world has ever known. What would have been miracles a generation ago are daily occurrences now. The prevention of disease by instructing owners, by sanitary measures, and by immunization involve a field of knowledge so vast that only those who study and toil with determination can hope to succeed. It is to acquaint one another with the new facts from research and experience and the success of new methods that veterinarians have gathered here from nearly every state in the union and province in the Dominion of Canada. These annual gatherings are as pilgrimages for more truth and further light. These men are dedicated to a public service. They are charged with the protection of many billions of dollars' worth of live stock on which our people and those of our allies depend for meat, animal fats, wool and leather.

It is the impression of many people, Sir, that the gasoline engine which is eliminating horses from our cities and which has intensified the barbarism of war, has made the equine species and the veterinary profession objects of history. On the contrary, there never was a war with a larger number of horses in proportion to its man power than this, and there never was a time when the veterinary profession was more in demand than today. Its functions have extended to the prevention and treatment of the diseases of food-producing animals generally. This has multiplied many times the problems of the practitioners. Many readjustments of the profession are being made. The live stock industry of the country, because of human dependence on domesticated animals, is looking to the veterinarian for protection. It has been said that agriculture is the backbone of the nation; that animal husbandry is the backbone of agriculture and that the veterinary profession is the support of animal husbandry. We are no longer obtaining our meat products from animals driven in from the

ranges where they have grown with little human attention but from animals that are coming from the farms where they have been raised as a part of agricultural activity with much labor and expense. Beyond the protection of animals, this profession is rendering a valuable public service in safeguarding the human species from the maladies communicable to it from dumb creation.

At this meeting, our number is likely to be much smaller than usual. This is not an indication of lack of interest but, rather, an expression of patriotism. Many of our members are in uniform in camps and at the battle front, and cannot be here. Others are looking after the flocks and herds of both their clients and those of their fellow practitioners who have gone with the colors. The veterinary profession has responded willingly and generously to the country's call. At all times since the beginning of the war, there has been a waiting list of veterinarians. Many who could not wait have gone as enlisted men in order to do their bit in this awful struggle for liberty and democracy. We have a just and professional pride in the patriotic service of so many of our members. We regret their absence but we rejoice exceedingly in the noble work they are doing. In due time their accomplishments for our country will be recorded and then we all will be proud of them.

Finally, as the program shows, the discussions at this meeting are on timely topics relative to the conservation of animals and means of rendering more efficient service to our clientele. I am taking the liberty, on behalf of the Association, of extending a hearty invitation to you, Sir, and through you to any and all individuals in your city who may be interested in our deliberations. Again I thank you for the privileges you have given us and I trust no undue advantages will be taken. We anticipate a pleasant and a profitable session and when we depart we shall go with feelings of gratitude toward the people of this city who have been so kind to us.

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#### REPORT OF THE COMMITTEE ON INTELLIGENCE AND EDUCATION, 1918.

Your Committee on Intelligence and Education submit the following report:

During the past year one of the members of the committee was called into Army Service and could not give attention to the work, one resigned and the term of one member expired—three new members were appointed to fill these vacancies.

Many conditions arose during the year to defer a meeting of the Committee and the first session was held in Chicago on March 4, 1918. Three members were present: J. A. Kiernan, R. C. Moore and the Chairman. A questionnaire requesting detailed information was prepared and forwarded to every veterinary college in the United States and Canada; replies were received from all colleges except the following: The University of Pennsylvania, McKillip Veterinary College, Washington State Veterinary College, and Texas State Veterinary College. It was decided in addition to the questionnaire that the Committee should visit as many of the veterinary colleges as possible and ascertain if the requirements of the Association were being carried out. Due to a number of causes an investigation of all of the colleges was not feasible.

During the year the Kansas City, San Francisco, Grand Rapids, and Terre Haute Veterinary Colleges have gone out of existence. The remaining veterinary colleges, nineteen (19) in number, with some notable exceptions, are not carrying out their work in such a manner as to be entirely above criticism.

However, special mention will not be made in this report of any particular schools with the exception of the two located in the District of Columbia. One of these institutions (the U. S. College of Veterinary Surgeons) was discredited at the 1917 meeting of this Association and had applied to the Committee for a reconsideration of their case. In view of this request a rather thorough investigation of the conditions surrounding veterinary training in the District was made by the Committee. The following facts were ascertained:

The United States College of Veterinary Surgeons has a reasonably good building and equipment for the operation of a school of veterinary medicine. The institution lacks, however, a resident dean and several competent instructors.

The George Washington University College of Veterinary Surgeons has inadequate facilities in buildings and equipment to give satisfactory instruction in the third and fourth year courses. It also lacks an adequate staff of competent veterinarians.

The war may further deplete the instructing staff of these two institutions. The fact that the ruling of the Secretary of Agriculture, preventing Bureau of Animal Industry veterinarians from assisting on the teaching staff of these institutions renders it practically impossible for them to maintain satisfactory corps of veterinary instructors at both colleges.

These facts prompt your Committee to recommend that the two schools be amalgamated, so that the students of the United States College may receive the laboratory courses at George Washington University and the George Washington students receive the use of the building and equipment of the United States College for their courses in anatomy, surgery and medicine.

In the absence of such a merger prior to the opening of the coming college year (1918) the Committee recommend that the United States College of Veterinary Surgeons be continued on the discredited list and that the George Washington College be automatically dropped from the list of colleges accredited by this Association.

The status of veterinary students in relation to the draft laws became an important question for consideration by your Committee. A conference was arranged with the War Department and the Bureau of Animal Industry in order to obtain uniform matriculation requirements for students entering all veterinary colleges. As a result of this conference the following regulations were adopted:

1. The matriculation requirements which shall be adopted by each accredited veterinary college for the year 1918 shall be at least two years of high school education of at least 7 credits (units) or their equivalent as certified by the Commissioner of Education or a similar official in the state where the student resides.
2. For the year 1919 the entrance requirement shall be at least 3 years of high school education and for the year 1920 the full 4 year high school course of 14 units shall be required.

Major Arnold of the Sanitary Corps notified the various colleges of this ruling. The United States Civil Service Commission adopted these regulations for all future appointments to the United States Bureau of Animal Industry Service.

The adoption of these regulations is the greatest step in advance ever made by this Association for higher veterinary education. They will be of great assistance to the Committee on Intelligence and Education, eliminating a vast amount of work in the examination of entrance qualifications, thus enabling the Committee to spend all of its time in investigation of the various courses of instruction, methods of teaching and the equipment of the various veterinary colleges.

Your Committee therefore recommends that the amendment to the constitution and by-laws offered by Major Kline at the 1917

meeting be modified to conform to paragraph 1 of these regulations, and that a full four-year high school course of at least fourteen units be the requirement for admission to accredited veterinary colleges in 1919, and that the amendment thus modified be referred to the Executive Board with a respectful request for immediate action.

The Committee recommends that a special committee be appointed by the President and to continue until their work is completed to compile a history of veterinary science and education in America. Your Committee would suggest a committee of five, one from the Army Service, one from the Bureau of Animal Industry, one from the practicing veterinarians, one from Canada and one at large.

Respectfully submitted,

Committee on Intelligence and Education.

GEO. W. DUNPHY, Chairman.

J. A. KIERNAN.

GEO. H. HART.

R. C. MOORE.

CASSIUS WAY, Secretary.

The Committee on Intelligence and Education have approved and submit the following:

We, the undersigned, hereby propose the name of Mr. E. S. Bayard, Editor of the National Stockman and Farmer, Pittsburg, Pa., for honorary membership in this Association. Mr. Bayard is one of the leading animal husbandry men in this country. As a member of the Board of Trustees of the Pennsylvania State College and editor of one of the leading live stock journals in this country, he is thoroughly familiar with all live stock industry questions. He has assisted in every possible way as a writer, public speaker and consultant in planning and enforcing the federal and state live stock sanitary laws. In the last outbreak of foot and mouth disease he was among the first to endorse and one of the strongest supporters of the plans adopted for the suppression and eradication of this disease. He loyally supported the Government in this work, doing so at the sacrifice of many lifelong and influential friends who held opposite views.

(Signed) C. J. MARSHALL.

S. H. GILLILAND.

J. R. MOHLER.

The Committee on Intelligence and Education have approved and submit the following:

We, the undersigned, hereby propose the name of John J. Ferguson, of Chicago, for honorary membership in this Association. For several years Mr. Ferguson was Secretary-Treasurer of the United States Live Stock Sanitary Association and largely through his efforts and efficient administration of that office the Association has grown to be a powerful factor for better things in live stock sanitary control work. He is a staunch supporter and friend of the veterinarian, and for years has taken an interest in the work of this Association. His ability in animal husbandry work and his keen interest, appreciation and knowledge of problems of sanitation, pre-eminently qualify him for honorary membership in this Association.

S. H. WARD.

N. S. MAYO.

CASSIUS WAY.

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#### SECRETARY'S OFFICE.

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At the meeting of the Executive Board in Philadelphia the desire was expressed that the Secretary should send something for the Journal each month. A number of items have been forwarded already and appear elsewhere in this issue.

The material and records of the Secretary's office were turned over to me on September 5, and three of us have been busy getting things posted up. This is the busy season in the Secretary's office, as most of the members are sending in their dues, and it is hoped that all will do so promptly, so that it will not be necessary to send out many "second notices."

Miss Green, who has assisted Dr. Day, Acting Secretary, is also assisting with the work. She was familiar with the details of the office, and this is of much importance. A change has been made, so that numbered receipts for dues are now sent out. Should any error occur, this method facilitates tracing the matter, as we have the duplicate numbered stub on file.

Now that the finances are checked up, letters and membership cards are being sent out to the more than one thousand new members that joined the Association at Philadelphia. As new applications are received, receipts for the remittance and card, stating that the doctor has filed a proper application, are sent to him. His subscription is also entered for the Journal to begin

at once. Many members, and particularly those in the army, are changing their locations. Be sure and notify either the editor of the Journal or the Secretary of your change of address, so that your mail and Journal will reach you.

We are now making out the list of members in Districts No. 2 and No. 3 in order to send out postal cards for nominations for members of the Executive Board. It is desired to have the new members elected in time to attend the next meeting of the Executive Board, which will probably be held in Chicago about the first of December.

At the present, the only list of members we have is arranged alphabetically. A new and complete card index file by states will be made at once in order to handle business that pertains to districts.

The Secretary will give all correspondence prompt and courteous attention. If a mistake has been made or something is not clear, we will do our best to correct the matter.

Every member of the Association should feel that the Association and the Journal are his, and take an active part in making both more efficient in promoting the interests of the profession. Send to the Editor of the Journal brief practical items that come up in your daily practice, and also personal news items. These add much to the value of the Journal, for they are the things the average member wants to know. Don't forget to get a new member for the Association during the year. We will send application blanks upon request.

"Do your bit."

N. S. MAYO, Secretary.

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## OTHER ASSOCIATIONS.

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### GEORGIA STATE VETERINARY ASSOCIATION.

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The Georgia State Veterinary Association will hold its twelfth annual meeting in the Senate Chamber, Atlanta, Ga., October 16 and 17, 1918.

H. C. HUTCHENS, President.

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### CHICAGO VETERINARY ASSOCIATION.

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The first fall meeting of the Chicago Veterinary Association was held on September 10. No formal program was presented. Drs. Campbell, Quitman, White and Mayo reported upon the A. V. M. A. meeting in Philadelphia.

Some unusual and ridiculous incidents in veterinary practice were related. Dr. John Jaffrey told of a severe case of tetanus in a horse. The owner insisted that the horse be treated by placing a board on the horse's head and hitting it with a sledge-hammer. As Dr. Jaffrey refused to treat him in this manner, the owner paid a big blacksmith two dollars to hit the horse. The blow killed the horse instantly.

Dr. Jas. Robertson told of a small boy who brought a puppy to his office to get the doctor to "bite the dog's tail off." The doctor also reported a case where a horse fell into a cellar while at work on an excavation. As the horse was somewhat lame, it was brought several blocks to the doctor's office. It was found that the leg was fractured, but the bones were not displaced until an assistant took up the foot. This horse had walked several blocks, the fractured bones having been held in place by the periosteum.

N. S. M.

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## THE WEST VIRGINIA VETERINARY MEDICAL ASSOCIATION.

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This Association held its thirtieth annual meeting at Parkersburg, W. Va., July 17 and 18, with a large attendance present.

The election of officers for the ensuing year resulted in the re-election of Dr. J. J. Cranwell, of Clarksburg, as President, and Dr. Ernest Layne, of Huntington, as Secretary. Dr. J. C. Callender, of Parkersburg, was elected to the office of Vice President.

Nine new members were admitted to membership, they having passed a satisfactory examination before the State Board on the previous day.

Several very interesting clinics were held at Dr. Callender's hospital. Numerous papers on subjects of vital importance were also discussed.

Hon. J. H. Stewart, Commissioner of Agriculture, was present and some important steps were taken to improve the usefulness of his office, both to the laity and the veterinary profession in the state.

A very elegant banquet was served at the Chancellor Hotel at the close of the session. ERNEST LANE, Secretary.

## NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS.

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### TO THE OFFICERS AND MEMBERS:

The semi-annual dues (per capita tax) of all members of this Association for the term of six months ending February 28, 1919, are now due at the rate of \$1.50 for each member. In this connection I respectfully quote the following extracts from our national constitution as adopted at the Philadelphia convention:

ART. 5, SEC. 2. The representation of any Association at the national convention shall be based on the average amount of per capita tax paid by that Association during the fiscal year.

ART. 10, SEC. 1. The fiscal year of this body shall begin on September 1 and end on the last day of the month of February.

ART. 10, SEC. 2. The per capita tax to cover the expenses of this Association shall be \$3.00 per annum and shall be collected from all active members by the State, Divisional and District Associations, and by them remitted to the National Secretary. Members-at-large shall remit per capita tax direct to the National Secretary. This tax may be paid semi-annually."

All drafts, exchanges, postoffice or express money orders should be made payable to Dr. S. J. Walkley, Secretary, 185 Northwestern Avenue, Milwaukee, Wisconsin.

Copies of minutes of proceedings of our Philadelphia convention, and copies of our national constitution and by-laws, as adopted at that meeting, will be distributed from this office as early as possible. State, Divisional and District Secretaries will please advise how many copies of those documents are needed. Each member of our Association is entitled to one copy of each and one copy of each should be sent to all B. A. I. veterinarians in your district who are non-members, with an invitation to join our ranks.

We are very fortunate in having completed the work at the Philadelphia convention of linking various State, Divisional and District Associations, and forming the National Association. In the absence of a national body, one State would be working for a certain salary schedule, while other States would be working along entirely different lines. The result would be chaos and confusion, with much wasted effort. Through the National Association we are assured unanimity of action through co-ordination of the efforts of the various Associations, composed of veterinarians in all branches of the Bureau service. In other words, there will be just one classification bill introduced in Congress affecting B. A. I. veterinarians, and each of the 1600 B. A. I. veterinarians will be boosting that bill. We could never expect

the enactment of a bill standardizing our salaries except through organized efforts, national in scope. The classification bill will be introduced in Congress as early as possible.

This organization is founded on sound principles and deserves the full support of each and every veterinarian in the Bureau service, more than 700 of whom were represented at our Philadelphia convention. All officers and members are urged to correspond with their colleagues in unorganized territory, urging them to enlist in this movement. Considerable correspondence has already been received in this office showing that our colleagues in different sections of the country appreciate the work we accomplished at the Philadelphia convention.

S. J. WALKLEY, Secretary.

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## NECROLOGICAL.

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### DR. WARD F. ROWLAND.

The following notice has been sent to the Journal by Dr. Leslie M. Hurt, Pasadena, California:

"Dr. Ward B. Rowland, a well-known resident of Pasadena for over thirty years, died at his home on Saturday evening after a prolonged illness. Dr. Rowland was Assistant State Veterinarian and had the Southern California counties as his jurisdiction. He is survived by his widow and one daughter, Mrs. Arnold Praeger of this city, and a brother, Dr. F. F. Rowland of Pasadena. The funeral service will be held from his home, 408 South Marengo avenue, on Tuesday afternoon, at 2:30 o'clock, and will be private.

Dr. Rowland was in his sixtieth year and was born in Media, Pennsylvania. He studied veterinary medicine in New York City under Dr. Liautard, a noted French veterinarian, and began his practice in Wilmington, Delaware. He built up a large practice there, and had charge of the horses in the stables of the Du Pont Powder Works.

In 1888 Dr. Rowland came to California and located at Pasadena. In those days there was a large number of horses and cattle in this vicinity. In one of the epidemics of glanders that swept through Southern California, Dr. Rowland became infected and poisoned his arm. He nearly died from the effects of the poison in his system, and felt the effects of it all his life.

Dr. Rowland had been active in Republican political circles and was well known in political affairs of the state. For nearly ten years he assisted the State Veterinarian, having charge of the work in the Southern California counties. For several years Dr. Rowland was in failing health.—*Pasadena Star-News*, Sept. 2.

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## REVIEWS.

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### THE CONSERVATION OF FOOD ENERGY.

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HENRY P. ARMSBY, Ph.D., L.L.D., Director of the Institute of Animal Nutrition of the Pennsylvania State College, Expert in Animal Nutrition, United States Department of Agriculture. (12mo of 65 pages; cloth, \$0.75 net. Publishers, W. B. Saunders Company, Philadelphia and London, 1918.)

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Dr. Armsby has been so long and favorably known as an investigator in the field of Animal Nutrition that anything on the subject coming from his pen is at once received as bearing the stamp of authenticity.

The little work under review is a *multum in parvo* of valuable information concerning the conservation of food energy which Dr. Armsby has accumulated during his many years of research work. To use a part of his own foreword, he submits the little work in the belief that the accumulated results of the researches in his own laboratory, as well as others, are capable of useful application, and should if possible be made of service in the present food situation.

Some idea of the many phases of the subject treated may be had by mentioning the different divisions or chapters:

Chap. (1) The Measure of Food Values; (2) Energy in Human Foods; (3) The Efficiency of the Animal; (4) Food Value of Increase by Animal; (5) The Overhead Feed Cost; (6) Wheat; (7) Corn; (8) Barley; (9) Rye; (10) Oats, Rice, Buckwheat; (11) Cottonseed; (12) Peanuts; (13) Milk; and (14) Summary.

Each chapter has its subdivisions, thereby amplifying the main divisions, rendering the subject-matter easily understood, and forming most interesting reading to anyone who is at all familiar with animal nutrition, which every member of the veterinary profession should be. We have no hesitation in heartily recommending this little book as a valuable contribution on the

subject, and which we believe should find a place in every veterinarian's library. The well-known publishers have executed their part in their usual excellent style.

W. H. D.

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## MISCELLANEOUS.

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### SAYS DISEASED COWS WERE FED TO THE BOYS.

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That diseased cows were killed at the Essex County Training School for Boys and fed to the inmates was charged this morning at the meeting of the Board of Health.

The matter was brought to a head when Dr. John F. Winchester, inspector of slaughtering and a veterinary in the city's service, complained that a letter written by him to H. C. Lithgoe, State Commissioner of Foods and Drugs, about the alleged breach of the slaughtering and health laws of the training school, was ignored. A copy of the letter to Mr. Lithgoe, sent to the County Commissioners, also remained unanswered.

The Board voted to call this breach of official etiquette, together with the alleged conditions at the training school, to the attention of Dr. Eugene R. Kelley, State Commissioner of the Health Department, and asked if the case merited official cognizance.

From the minutes of the meeting today it was gleaned that a former employee of the training school reported that diseased cattle were killed at the training school farm and fed to the boys. The Superintendent admitted killing cattle that were "under suspicion for disease." He did not relish the idea of the local health authorities interfering, and told the Superintendent of Sanitation and the Chairman of the Board of Health that his institution was under the jurisdiction of the county authorities. He readily agreed, however, that he would not kill any more cattle for food or for sale without complying with the state and city slaughtering laws regarding the inspection of the carcass.

This all happened July 31 and August 1, but it only reached the public prints very recently.

The Board voted to write the County Commissioners urging them to instruct the local training school officials to cease slaughtering calves, cows or pigs unless the city or state slaughtering inspectors were present.

Dr. William J. Sullivan said he did not believe that this would prove effective, as he had issued a similar warning in 1910 after some swine, not duly inspected and branded, had been sold to a local market.—Lawrence (Mass.) Press.

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### CONFERENCE ON TICK ERADICATION.

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At a conference on tick eradication, by the employees of the Bureau of Animal Industry in Louisiana, held in New Orleans on September 21, the following list of interesting subjects was presented:

Address, Hon. John M. Parker, U. S. Food Administrator for Louisiana.

Address, "Necessity of Late Dipping," Dr. Edward Horstman, Baton Rouge, La.

Address, "Alabama Methods of Enforcing Late Dipping," Dr. R. E. Jackson, Inspector in Charge, Birmingham, Ala.

Address, Dr. E. Pegram Flower, Secretary and Executive Officer, Louisiana State Live Stock Sanitary Board.

Address, Dr. W. H. Dalrymple, Professor of Veterinary Science, Louisiana State University, and Veterinarian State Experiment Stations.

Address, "How to Manage Ticky Herds After October 1 in Territory to be Released December 1," Dr. J. A. Barger, Inspector in Charge, Jackson, Miss.

Address, "My Tactics Used in Handling Tick Eradication in New Territory, With View of Holding Coöperation Until the Last Tick Has Vanished," Dr. G. E. Ellis, Natchitoches, La.

Address, "The Relation of Law and Coöperation in the Beginning and Final Work of Tick Eradication," Dr. J. B. Reidy, Inspector in Charge, Houston, Texas.

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### PRESENTATION OF PORTRAITS.

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An extremely interesting feature of the recent A. V. M. A. convention was the presentation, by Dr. R. F. Eagle of Wilson & Co., Chicago, of portraits in oils of the late Dr. D. E. Salmon and Dr. A. D. Melvin, former chiefs of the Bureau of Animal Indus-

try, and the present incumbent, Dr. J. R. Mohler, which are to occupy places in the portrait gallery of the Saddle and Sirloin Club. This mark of appreciation of the veterinary profession by the live stock interests, and the close intimacy between the two which this graceful act emphasizes, is said to have made a deep impression on the members of the National Veterinary Association.—From the *Breeder's Gazette*.

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### TICKS "ON THE RUN" IN LOUISIANA.

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According to Dr. E. I. Smith, B. A. I., in charge of tick eradication in Louisiana, the total number of cattle dippings in August were 2,113,386; 84,461 horses and mules were inspected, and 32,188 were dipped.

About 5,000 dipping vats are available, or in operation, in Louisiana, in which 10,518,087 dippings have taken place, under Federal supervision, from March 15, 1918, to September 1, 1918. This has reduced the tick infestation in the State to one-tenth what it was at the commencement of the work in April, 1918.

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—Dr. R. J. W. Briggs has been transferred from Iowa Falls, Iowa, to Baton Rouge, Louisiana, as Inspector in Charge of Hog Cholera work in the Pelican State.

—Dr. C. M. McCoy, B. A. I., has been transferred from Baton Rouge, Louisiana, to Denver, Colorado.

—Dr. W. M. Tucker has been transferred to Louisiana to engage in tuberculosis eradication in that State. Before his transference, the Doctor had been working from the B. A. I. office in Washington.

Dr. James E. Anderson has removed from Ligonier to Angola, Ind.

Dr. A. H. Julien has removed from Camilla, Ga., to 802 Bellows Avenue, Columbus, O.

Dr. H. T. D. Lackie has removed from Omaha, Neb., to Willow City, N. D.

Dr. Percy Lamb, formerly of Worthing, England, is now located at 630 W. Hampden, Englewood, Colo.

Dr. Robert Boyd of San Francisco, Cal., is now Chief Meat Inspector at Stockton, Cal.

Dr. F. E. Boyd has removed from Columbia, Pa., to 652 Jersey Avenue, Jersey City, N. J.

Dr. J. J. Frey has removed from Sacramento to Placerville, Cal.

Dr. R. J. W. Briggs, who has been connected with the force of Dr. J. S. Koen of Des Moines, Iowa, has been transferred to inspector in charge of hog cholera work in Louisiana, and is stationed at Baton Rouge, La.

Dr. Harry Dell has been transferred from Chicago, Ill., to B. A. I., Box 236, Dubuque, Iowa.

Dr. R. C. Surface has severed his connection as veterinary inspector on tick eradication for B. A. I. to engage in private practice at Altamont, Mo.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION,  
ETC., REQUIRED BY THE ACT OF AUGUST 24, 1912, OF THE  
JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSO-  
CIATION (FORMERLY THE AMERICAN VETERINARY REVIEW),  
FOR OCTOBER 1, 1918:

Editor—W. H. Dalrymple, Baton Rouge, La.

Managing Editor—None.

Business Manager—W. H. Dalrymple, Baton Rouge, La.

Publisher—American Veterinary Medical Association.

Owners—If a corporation, give its name and the names and addresses of stockholders holding 1 per cent or more of the total amount of stock; if not a corporation, give names and addresses of individual owners) : American Veterinary Medical Association. A non-stock Association. Officers: President, V. A. Moore, Ithaca, N. Y.; Secretary, N. S. Mayo, Chicago, Ill.; Treasurer, M. Jacob, Knoxville, Tenn.

Known bondholders, mortgagees and other security-holders, holding 1 per cent or more of total amount of bonds, mortgages or other securities—None.

W. H. DALRYMPLE, Editor.

Sworn to and subscribed before me this 17th day of September, 1918.

ALBERT LIGON, Notary Public.

(SEAL) (My commission expires March 4, 1921)

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**THE TIME**

*to subscribe for the Journal  
of the A. V. M. A.*

**IS NOW**

